This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

E. H. B.

No. .....

BOSTON

MEDICAL LIBRARY,

19 BOYLSTON PLACE.

TRANSACTIONS

OF THE

ROYAL ACADEMY OF MEDICINE IN IRELAND.

TRANSACTIONS

OF THE

Royal Academy of Medicine

IN IRELAND.

VOL. XII.

EDITED BY

WILLIAM THOMSON, M.A., F.R.C.S.,

GENERAL SECRETARY;

SURGEON TO THE RICHMOND HOSPITAL, DUBLIN.

DUBLIN:

FANNIN AND COMPANY, GRAFTON-STREET.

LONDON: BAILLIÈRE, TINDALL, & COX.

EDINBURGH: JAMES THIN.

BRISTOL: JOHN WRIGHT & CO.

1894.

BOSTON MEDICAL
DEC 3 1898
LIBRARY.

DUBLIN: PRINTED BY JOHN FALCONER, 53 UPPER SACKVILLE STREET.

CATALOGUED
DEC 3 1898
E. H. B.

CONTENTS.

	Page
List of Officers,	ix
List of Fellows,	xiii
List of Members,	xxv
List of Student Associates,	xxvi
Rules,	xxvii
Annual Report,	xxxv
Treasurer's Report,	xxxvii

SECTION OF MEDICINE.

A case of warty disease of the legs,	Dr. H. C. Tweedy,	1
Pernicious anæmia,	Dr. James Craig,	6
Malignant endocarditis,	Dr. John J. Burgess,	25
A case of associated paralysis of the right portio dura and pneumogastric nerves,	Dr. J. W. Moore,	35
Sequel of a case of myxœdema treated by thyroid juice,	Dr. James Little,	48
Note on a case of insular sclerosis,	Dr. H. C. Tweedy,	52
An unusual case of Graves's disease,	Dr. James Craig,	57
Notes on cases of a severe type of influenza,	Dr. John J. Burgess,	70
Case of thrombosis of the portal, mesenteric, and gastric veins,	Dr. Walter G. Smith,	82
A case of cancrum oris in typhoid fever,	Dr. H. T. Bewley,	84
Tetany,	Dr. Alfred R. Parsons,	93

SECTION OF SURGERY.

		Page
Removal of tumour of brain,	MR. F. ALCOCK NIXON,	99
Urinary fistulæ and their treatment; with a case of penetrating wound of rectum producing peritonitis, followed by laparotomy, recto-vesical fistula, and recovery,	MR. T. MYLES,	108
The operative treatment of enlarged prostate,	MR. ARTHUR CHANCE,	119
Laminectomy in certain cases of spinal injury, with notes of a case,	MR. T. MYLES,	130
Fibrous stricture of the œsophagus treated by gastrotomy and retrograde dilatation,	MR. KENDAL FRANKS,	142
Some interesting cases of gunshot wounds,	MR. AUSTIN MELDON,	161
Nephrorrhaphy and Nephrectomy,	MR. J. S. M'ARDLE,	165
Suture of sciatic nerve,	MR. J. DALLAS PRATT,	181
Three cases of popliteal aneurysm,	MR. J. V. LENTAIGNE,	187
A case of naso-pharyngeal fibroma,	MR. ROBERT H. WOODS,	194

SECTION OF OBSTETRICS.

Operative treatment of such herniæ as appear the result of congenital defect of linea alba, or as the outcome of laparotomy,	MR. J. S. M'ARDLE,	203
Colectomy for adhesion of cæcum to old ovarian pedicle and tubercular appendix,	DR. ALFRED J. SMITH,	216
On vaginal hysterectomy,	DR. LOMBE ATTHILL,	223
Myomata treated by ergot,	DR. R. D. PUREFOY,	236
Ovariotomy performed on an insane patient, exemplifying also the life history of a uterine fibroid,	DR. LOMBE ATTHILL,	242
Ruptured tubal pregnancy, with intra-peritoneal hæmorrhage, successfully treated by abdominal section,	DR. ALFRED J. SMITH,	246
Notes on a case of hemi-encephaloid fœtus,	DR. W. J. THOMPSON,	253
Observations on the ætiology, prevention, and treatment of puerperal septicæmia,	DR. T. MORE MADDEN,	256

SECTION OF PATHOLOGY.

Mirco-chemical reaction of cells in their relation to immunity,	DR. J. A. SCOTT,	274
Large coagulum adherent to the mitral valve in a case of acute rheumatism fatal through hyperpyrexia,	DR. J. W. MOORE,	288
Two cases of hydrocephalus, associated with complete absence of communication between the fourth ventricle and the subarachnoid space,	DR. JOSEPH O'CARROLL,	293

Page

Dilatation of the stomach, with remarks on enteroptosis (Glénard's disease), - - } DR. H. C. TWEEDY, - 298

Case of locomotor ataxy, with specimen of Charcot's disease, - - - } DR. G. P. L. NUGENT, - 305

Fracture of base of skull, - - - DR. E. H. BENNETT, - 315

Fracture of the patella, - - - DR. E. H. BENNETT, - 318

SECTION OF STATE MEDICINE.

Recent developments in State medicine, - MR. D. EDGAR FLINN, - 320

Some points in connection with the administration of hospital relief, - - - } DR. H. C. TWEEDY, - 332

SECTION OF ANATOMY AND PHYSIOLOGY.

On the position of anatomy in general and the central nervous system in particular, with lime-light demonstration of anatomy from the morphological side (macroscopic, minute, and developmental), - - } DR. FRASER, - - 343

Case of single unilateral kidney, - - DR. H. C. TWEEDY, - 356

On the lobus olfactorius impar, - - DR. FRASER, - - 359

On various single and double monstrosities, with remarks on anencephelic and amyelic nervous systems, - - - - } DR. FRASER, - - 364

A case of complete transposition of the thoracic and abdominal viscera, - - } DR. FRASER, - - 367

The muscles of the external ear, - - DR. A. BIRMINGHAM, - 369

Peculiar horse-shoe kidney, and irregular lateral sinuses, - - - - } DR. A. BIRMINGHAM, - 388

Report of collective investigation in the anatomical department of Trinity College, Dublin, - - - - - - - 390

Report of collective investigation in the anatomical department of the Catholic University Medical School, - - - - - 403

LIST OF ILLUSTRATIONS.

Page

A case of warty disease of the legs (Dr. H. C. Tweedy), - - 1

A case of naso-pharyngeal fibroma (Mr. Robert H. Woods), - - 194

Operative treatment of such herniæ as appear the result of congenital defect of linea alba, or as the outcome of laparotomy (Mr. J. S. M'Ardle), - - - - - - - - - 203

Colectomy for adhesion of cæcum to old ovarian pedicle and tubercular appendix (Dr. Alfred J. Smith), - - - - - - 216

Two cases of hydrocephalus, associated with complete absence of communication between the fourth ventricle and the sub-arachnoid space (Dr. Joseph O'Carroll), - - - - - - 293

Case of locomotor ataxy with specimen of Charcot's disease (Dr. G. P. L. Nugent), - - - - - - - - - 305

On the position of anatomy in general and the central nervous system in particular, with lime-light demonstration of anatomy from the morphological side (macroscopic, minute, and developmental) (Dr. Alec Fraser, - - - - - - - - 343

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SESSION 1893-94.

OFFICERS.

President:
GEORGE H. KIDD, M.D., F.R.C.S., 58 Merrion-square, South.

General Secretary and Treasurer:
WILLIAM THOMSON, F.R.C.S., 54 St. Stephen's-green, E.

Secretary for Foreign Correspondence:
JOHN W. MOORE, 40 Fitzwilliam-square.

General Council:

GEORGE H. KIDD, President.
SIR JOHN BANKS, K.C.B., Ex-President.
SAMUEL GORDON, Ex-President.
WALTER G. SMITH, President of Medical Section.
EDWARD HAMILTON, President of Surgical Section.
R. D. PURFOY, President of Obstetrical Section.
J. A. SCOTT, President of Pathological Section.
ALEC FRASER, President of Section of Anatomy and Physiology.
D. EDGAR FLINN, President of Section of State Medicine.
WILLIAM THOMSON, General Secretary and Treasurer.
JOHN WILLIAM MOORE, Secretary for Foreign Correspondence.
A. N. MONTGOMERY, Secretary Medical Section.
KENDAL FRANKS, Secretary Surgical Section.
FRED. W. KIDD, Secretary Obstetrical Section.
J. B. STORY, Secretary Pathological Section.
A. BIRMINGHAM, Secretary Section of Anatomy and Physiology.
NINIAN FALKINER, Secretary Section of State Medicine.

WALLACE BEATTY, H. C. TWEEDY, } Representatives from Medical Council.
SIR WM. STOKES, W. THORNLEY STOKER, } Representatives from Surgical Council.
LOMBE ATTHILL, R. H. FLEMING, } Representatives from Obstetrical Council.
J. M. FINNY, J. M. PURSER, } Representatives from Pathological Council.

Council of Medical Section:

President—WALTER G. SMITH, President of the Royal College of Physicians.

1. *Secretary*—A. N. MONTGOMERY, 45 Upper Sackville-street.

2. WALLACE BEATTY,
3. J. HAWTREY BENSON,
4. E. MACDOWEL COSGRAVE,
5. JAMES CRAIG,
6. J. MAGEE FINNY,
7. RICHARD A. HAYES,
8. J. W. MOORE,
9. J. O'CARROLL
10. H. C. TWEEDY.

Council of Surgical Section:

President—EDWARD HAMILTON, President of the Royal College of Surgeons.

1. *Secretary*—KENDAL FRANKS, 6 Fitzwilliam-square.

2. C. B. BALL,
3. HENRY FITZGIBBON,
4. JOHN LENTAIGNE,
5. AUSTIN MELDON,
6. THOMAS MYLES,
7. SIR W. STOKES,
8. W. THORNLEY STOKES,
9. R. L. SWAN,
10. WM. I. WHEELER.

Council of Obstetrical Section:

President—R. D. PUREFOY, 20 Merrion-square.

1. *Secretary*—FRED. W. KIDD, 17 Lower Fitzwilliam-street.

2. L. ATTHILL,
3. ROBERT A. FLYNN,
4. R. H. FLEMING,
5. A. J. HORNE,
6. J. L. LANE,
7. S. R. MASON,
8. ARTHUR V. MACAN,
9. A. J. SMITH,
10. W. J. SMYLY.

Council of Pathological Section:

President—J. A. SCOTT, 36 Lower Baggot-street.

1. *Secretary*—J. B. STORY, 6 Merrion-square, North.

2. A. W. BAKER,
3. A. H. BENSON,
4. H. BEWLEY,
5. J. MAGEE FINNY,
6. EDMOND J. MACWEENEY,
7. CONOLLY NORMAN,
8. J. O'CARROLL,
9. A. R. PARSONS,
10. J. M. PURSER.

Council of Section of Anatomy and Physiology:

President—ALEC FRASER, 18 Northbrook-road.

1. *Secretary*—A. BIRMINGHAM, Medical School, Cecilia-street.

2. H. BROOMFIELD,
3. D. J. COFFEY,
4. D. J. CUNNINGHAM,
5. H. C. EARL,
6. R. H. WOODS.

Council of Section of State Medicine:

President—D. EDGAR FLINN, 37 Merville-place, Kingstown.

1. *Secretary*—NINIAN FALKINER, 81 Lower Leeson-street.

2. E. MACDOWEL COSGRAVE,
3. THOMAS DONNELLY,
4. J. W. MOORE,
5. J. M. REDMOND,
6. H. C. TWEEDY.

Reference Committee:

1. RICHARD A. HAYES,
2. KENDAL FRANKS,
3. ALFRED J. SMITH,
4. JOHN B. STORY.

HONORARY FELLOWS.

1885*Billroth, Professor T., Vienna.
1885*Charcot, Professor, Paris.
1885 Emmet, Thomas Addis, 9 Madison Avenue, New York.
1885*Flint, Professor Austin, New York.
1885 Hutchinson, Mr. Jonathan, F.R.S., London.
1885 Jenner, Sir William, Bart., F.R.S., London.
1885 Keith, Thomas, London.
1885 Kölliker, Professor, Würzburg.
1885 Lister, Sir Joseph, Bart., F.R.S., London.
1885 Ludwig, Professor, Leipsic.
1885 Paget, Sir James, Bart., F.R.S., London.
1885 Pasteur, Professor, Paris.
1885*Schrœder, Professor, Berlin.
1885 Simon, Sir J., F.R.S., London.
1885 Virchow, Professor, Berlin.
1885 Von Recklinghausen, Professor, Strasburg.

* Dead.

FELLOWS.

[*The figures prefixed denote the date of election. The figures appended to Names denote the number of Communications. Original Fellows are marked* †].

1885 ASHE, ST. GEORGE, L.R.C.P., L.R.C.S., Medical Officer No. 2 South City Dispensary, 66 Lower Baggot-street, Dublin.

1889 ATKINS, RINGROSE, M.D., Medical Superintendent, District Lunatic Asylum, Waterford.

† ATTHILL, LOMBE, M.D., Ex-President R.C.P., late Master Rotunda Lying-in Hospital, 94 Merrion-square, W. [2]

† AUCHINLECK, HUGH ALEXANDER, F.R.C.S., Professor of Medical Jurisprudence, R.C.S., 7 Harcourt-street, Dublin.

1891 BAIRD, JAMES H., L.R.C.P., L.R.C.S., Assistant Surgeon R. I. Constabulary, 5 Blackhall-street, Dublin.

† BAKER, ARTHUR WYNDOWE WILLERT, M.D., F.R.C.S., Surgeon to the Dental Hospital of Ireland, Dental Surgeon to St. Mark's Ophthalmic Hospital, 18 Lower Fitzwilliam-street, Dublin.

† BALL, CHARLES BENT, M.D., F.R.C.S., Surgeon Sir P. Dun's Hospital, 24 Merrion-square, N., Dublin.

† BANKS, SIR JOHN, K.C.B., M.D., F.R.C.P., Physician Richmond, Whitworth, and Hardwicke Hospitals, Regius Professor of Physic, Univ. Dub., Ex-President British Medical Association, Physician in Ordinary to Her Majesty the Queen in Ireland, 45 Merrion-square, East, Dublin.

1891 BARRY, PATRICK JOSEPH, L.R.C.P., L.R.C.S., 50 Merrion-square, East, Dublin.

† BARTON, JOHN, M.D., Demonstrator of Anatomy, Royal College of Surgeons, 26 Upper Merrion-street, Dublin.

1892 BATE, ABRAHAM WM., M.B., F.R.C.S., Brigade Surgeon, Medical Staff, retired, 50 Northumberland-road.

† BEATTY, JOSEPH, F.R.C.S., Surgeon Monkstown Hospital, 3 Howard-place, Kingstown.

† BEATTY, WALLACE, M.D., F.R.C.P., Assistant Physician Adelaide Hospital, 38 Merrion-square, E., Dublin.

† BENNETT, EDWARD HALLARAN, M.D., F.R.C.S., Surgeon to Sir P. Dun's Hospital, Professor of Surgery Trinity College, 26 Lower Fitzwilliam-street, Dublin. [2]

† BENSON, ARTHUR HENRY, F.R.C.S., Ophthalmic Surgeon City of Dublin Hospital, Assistant Surgeon St. Mark's Ophthalmic Hospital, 42 Fitzwilliam-square, W., Dublin.

† BENSON, J. HAWTREY, M.D., F.R.C.P., Consulting Physician City of Dublin Hospital, 57 Fitzwilliam-square, N., Dublin.

† BERNARD, WALTER, F.R.C.P., 14 Queen-street, Londonderry.

1887 BERRY, WM., L.R.C.P. Edin., F.R.C.S., Surgeon Royal Albert Edward Infirmary, Appleton Cottage, Great George-street, Wigan.

1887 BEWLEY, HENRY T., M.D., F.R.C.P., Assistant Physician Adelaide Hospital, 26 Lower Baggot-street, Dublin. [1]

1887 BIRMINGHAM, A., M.D., Professor of Anatomy Catholic University School, Cecilia-street. [2]

1891 BOYD, J. ST. CLAIR, M.D., Gynæcologist Ulster Hospital, 19 Victoria-place, Belfast.

† BOYD, MICHAEL AUSTIN, F.R.C.S., M.R.C.P., Physician Mater Misericordiæ Hospital, 30 Merrion-square, North, Dublin.

1884 BROOKS, H. ST. JOHN, M.D., Sc.B., Surgeon to Sir P. Dun's Hospital, University Anatomist, Univ. Dublin, 52 Lower Mount-street, Dublin.

† BROOMFIELD, HUMPHREY JOHN, F.R.C.S., Surgeon, County Infirmary, Carlow.

1891 BROWNE, HENRY PETER, M.R.C.P., F.R.C.S. Edin., Medical Officer Delgany Dispensary, West Malvern, Delgany, Greystones.

1883 BROWNE, J. WALTON, A.B., M.D., Surgeon to the Royal Hospital 10 College-square, North, Belfast.

† BROWNE, ROBERT, F.R.C.S., Physician Maison de Santé, Hopeton, Terenure-road, Rathgar, Dublin.

1884 BURGESS, JOHN J., F.R.C.S., late Assistant Surgeon to the Richmond Hospital, Westland-row, Dublin. [2]

1884 BURKE, JOHN RICHARD, M.D., Deputy Inspector-General, Hospitals and Fleets, R.N., 22 Gardiner's-place, Dublin.

1891 BYRNE, HERBERT U., M.B.. B.Ch., Univ. Dublin, Medical Officer No. 4 Dispensary District, South Dublin Union, 15 Upper Merrion-street, Dublin.

1891 BYRNE, LOUIS A., L.R.C.P., F.R.C.S., Surgeon Jervis-street Hospital, 20 High-street, Dublin.

1891 BYRNE, WILLIAM S., M.B., B.Ch., Anne-street, Fortitude Valley, Brisbane, Queensland.

† CAMERON, SIR CHARLES A., M.D., F.R.C.S., Professor of Chemistry Royal College of Surgeons, Superintendent Medical Officer of Health, City and County Analyst, Dublin, 51 Pembroke-road, Dublin.

1884 CHANCE, ARTHUR, F.R.C.S., L.R.C.P., Surgeon to Mater Misericordiæ Hospital, 90 Merrion-square. [1]

1891 COFFEY, DENIS J., M.B., Demonstrator, Catholic University Medical School, Dublin.

1891 COLAHAN, NICHOLAS WHISTLER, M.D., M.Ch., Professor of Materia Medica and Therapeutics, Queen's College, Villa, Galway.

1891 COLE-BAKER, GEORGE, M.D., B.Ch., Assistant Master Coombe Lying-in Hospital, 28 Lower Baggot-street, Dublin.

1891 COLEMAN, JAMES BYRNE, M.B., B.Ch., Physician Jervis-street Hospital, 15 Westland-row, Dublin.

1883 COOPER, AUSTIN N., F.R.C.S., Tamworth, N.S.W., Australia.

† COPPINGER, CHARLES, F.R.C.S., Surgeon to the Mater Misericordiæ Hospital, 11 Upper Merrion-street, Dublin.

† COSGRAVE, E. MACDOWEL, M.D., M.Ch. F.R.C.P., Professor of Botany and Zoology R.C.S., Physician to Drumcondra Hospital, and to Cork-street Fever Hospital, 5 Gardiner's-row, Dublin.

1883 COX, MICHAEL F., F.R.C.P., Physician St. Vincent's Hospital, 45 Stephen's-green, E.

1889 CRAIG, JAMES, M.D., Assistant Physician Meath Hospital, 35 York-street, Dublin. [2]

† CRANNY, JOHN JOSEPH, M.D., F.R.C.S., Surgeon to Jervis-street Hospital, 17 Merrion-square, N., Dublin.

† CROLY, HENRY GRAY, F.R.C.S., ex-President R.C.S., Surgeon City of Dublin Hospital, 7 Merrion-square, N., Dublin.

1884 CRONYN, JOHN G., L.R.C.S., L.R.C.P., Medical Officer South Dublin Union Workhouse, 4 Clare-street, Dublin.

† CRUISE, FRANCIS RICHARD, M.D., F. & Ex-Pres. R.C.P., Consulting Physician Mater Misericordiæ Hospital, 93 Merrion-square., W., Dublin.

† CUNNINGHAM, D. J., F.R.C.S., F.R.S. Professor of Anatomy, University of Dublin, 43 Fitzwilliam-place, Dublin.

1893 DALY, F. B., M.B., T.C.D., Surgeon-Major A.M.S., 10 Eccles-street, Dublin.

1893 DAWSON, W. R., M.B., Univ. Dublin, Farnham House, Finglas, Dublin.

1889 DAVIS, F. A. G., M.B., L.R.C.S., Demonstrator of Anatomy, R.C.S., 12 Lower Fitzwilliam-street, Dublin.

1891 DEMPSEY, MARTIN J. P., M.B., B.Ch., 184 Gt. Brunswick-street, Dublin.

† DENHAM, J. KNOX, L.R.C.P., Medical Officer to Donnybrook Dispensary, 25 Northumberland-road, Dublin.

1884 DONNELLY, THOMAS, M.D., F.R.C.S., Assistant Physician Richmond Whitworth and Hardwicke Hospitals, 14 Rutland-square, Dublin.

1887 DONNELLY, MICHAEL A., F.R.C.S., 187 Great Brunswick-street, Dublin.

† DOYLE, JOSEPH P., L.R.C.P., Surgeon and Physician St. Joseph's Hospital for Sick Children, 23 Lower Fitzwilliam-street, Dublin.

† DUFFEY, GEORGE FREDERICK, M.D., F.R.C.P., Physician City of Dublin Hospital, Professor of Materia Medica R.C.S. Medical School, 30 Fitzwilliam-place, Dublin.

1893 DUNNE, F. J., M.B., R.U.I., late Resident Physician Mater Misericordiæ Hospital, 39 Stephen's-green, East, Dublin.

1885 DWYER, F. CONWAY, M.D., Surgeon Jervis-street Hospital, 4 Great Denmark-street, Dublin.

1889 EARL, HENRY CECIL, M.D., Assistant to Professor of Physiology, Trinity College, 3 Holles-street, Dublin.

† ELLIS, GEORGE, F.R.C.S., M.B., 91 Lower Leeson-street, Dublin.

† EUSTACE, JOHN, M.D., L.R.C.S., Resident Physician Hampstead, Highfield, and Elmhurst Lunatic Asylum, Drumcondra, Co. Dublin.

1883 EVANS, WILLIAM R., M.D., L.R.C.S., 19 Merrion-square, N., Dublin.

1887 FALKINER, NINIAN M'INTIRE, M.B., F.R.C.P., Medical Officer Grand Canal-street Dispensary, 81 Lower Leeson-street.

1888 FERGUSON, HENRY LINDO, M.D., F.R.C.S., Dunedin, New Zealand.

† FINNY, JOHN MAGEE, M.D., F.R.C.P., Physician Sir P. Dun's Hospital, King's Professor of Practice of Medicine, School of Physic, late President R.C.P., 36 Merrion-square, Dublin.

† FITZGERALD, CHARLES E., M.D., F.R.C.P., Surgeon-Oculist in Ordinary to the Queen in Ireland, Surgeon to National Eye and Ear Infirmary, 27 Upper Merrion-street, Dublin.

1891 FITZGERALD, FRANCIS CREIGHTON, L.R.C.P., L.R.C.S., Medical Officer Dispensary District, Newtownbutler, Co. Fermanagh.

† FITZGIBBON, HENRY, F.R.C.S., Ex-President Royal College of Surgeons, Surgeon City of Dublin Hospital, 49 Merrion-square, E., Dublin.

1889 FFRENCH-MULLEN, ST. LAURENCE, M.D., Retired Fleet-Surgeon R.N., Ophally, Dundrum.

1884 FLEMING, ROBERT H., M.B., late Assistant Physician Rotunda Hospital, 30 Lower Baggot-street, Dublin.

† FLETCHER, ROBERT VICARS, F.R.C.S., Resident Medical Superintendent District Lunatic Asylum, Ballinasloe, Co. Galway.

† FLINN, DAVID EDGAR, F.R.C.S., Surgeon St. Michael's Hospital, Kingstown, 37 Merville-place, Kingstown. [1]

1891 FLYNN, ROBERT ALEXANDER, L.R.C.P., L.R.C.S., late Assistant Master Rotunda Hospital, Lower Baggot-street, Dublin.

1886 FOTTRELL, WM. JOSEPH, L.R.C.S., Medical Officer, North Dublin Union Workhouse, 2 Rutland-square, Dublin.

† FOY, GEORGE MAHOOD, F.R.C.S., Surgeon Drumcondra Hospital, 7 Cavendish-row, Dublin.

† FRANKS, KENDAL, M.D., F.R.C.S., Surgeon to Adelaide Hospital, Surgeon Throat and Ear Hospital, 6 Fitzwilliam-square, Dublin. [1]

1887 FRASER, ALEC, M.B., Professor of Anatomy Royal College of Surgeons, Ireland. [4]

† FRAZER, WILLIAM, F.R.C.S., 20 Harcourt-street, Dublin.

1882 FREEMAN, WILLIAM HENRY, L.R.C.P. Lond., F.R.C.S., Surgeon Royal United Hospital, Bath, 24 Circus, Bath.

1891 GLENN, JOHN HUGH ROBERT, M.D., B.Ch., late Assistant Physician, Rotunda Hospital, 24 Lower Baggot-street, Dublin.

† GORDON, SAMUEL, M.D., F.R.C.P., Physician to the Richmond, Whitworth, and Hardwicke Hospitals, 13 Hume-street, Dublin.

1889 GORDON, S. T., L.R.C.P., L.R.C.S., Surgeon R.I. Constabulary, Depot Phœnix Park, Dublin.

1893 GORDON, THOMAS EAGLESON, M.B., Univ. Dublin, late House Surgeon Adelaide Hospital, 53 Lower Baggot-street, Dublin.

1887 GRAVES, WILLIAM ROBERT, L.R.C.P., L.R.C.S., 27 Lower Fitzwilliam-street, Dublin.

1893 GRAY, ROBERT, M.R.C.P., L.R.C.S., Medical Officer, Armagh Dispensary District, 4 Charlemont-place, The Mall, Armagh.

† GREENE, THOMAS WM. NASSAU, L.R.C.S., Monte Video, South America.

† GRIMSHAW, THOMAS WRIGLEY, M.D., F.R.C.P., Registrar-General for Ireland, Priorsland, Carrickmines, Co. Dublin.

1886 GUNN, CHRISTOPHER, M.D., M.R.C.P., Surgeon Jervis-street Hospital, 125 Stephen's-green.

† HAMILTON, EDWARD, M.D., F.R.C.S., Surgeon Steevens' Hospital, late President Royal College of Surgeons, 120 Stephen's-green, W., Dublin.

1892 HAMILTON, WM. COPE, L.R.C.S. & P., Resident Surgeon, Steevens' Hospital.

1889 HAMILTON, W. R. F., L.R.C.P., L.R.C.S., Medical Officer, Dispensary, Edenderry.

† HARLEY, ROBERT WILLIAM, L.R.C.S., 21 Pembroke-road, Dublin.

† HAUGHTON, SAMUEL (Clk.), M.D., F.R.C.P., F.R.S., School of Physic, Trinity College, Dublin.

† HAYES, PATRICK JOSEPH, F.R.C.S. Edin., Surgeon Mater Misericordiæ Hospital, Lecturer on Surgery in the Catholic University School of Medicine, 18 Merrion-square, Dublin.

† HAYES, RICHARD ATKINSON, M.D., F.R.C.S., Physician Steevens' Hospital, Physician for Diseases of Throat, National Eye and Ear Infirmary, 82 Merrion-square, South, Dublin.

† HEARN, RICHARD THOMAS, M.D., L.R.C.S., Medical Officer Rathmines Dispensary, South Dublin Union, 7 Belgrave-square, East, Rathmines, Dublin.

† HEMPHILL, WILLIAM D., M.D., F.R.C.S., Surgeon Co. Tipperary Gaol, South Riding, Visiting Physician Clonmel District Lunatic Asylum Oakville, Clonmel, Co. Tipperary.

† HEPBURN, WILLIAM JOSEPH, F.R.C.S. Edin., Surgeon Meath Hospital and Co. Dublin Infirmary, 31 Upper Merrion-street, Dublin.

† HEUSTON, FRANCIS TYDD, F.R.C.S., Professor of Anatomy Royal College of Surgeons, Surgeon Adelaide Hospital, 15 Stephen's-green, N., Dublin.

† HORNE, ANDREW JOHN, F.R.C.P., Master National Lying-in Hospital, 24 Harcourt-street, Dublin.

1883 JACOB, DAVID, M.D., F.R.C.S., Surgeon Queen's County Infirmary Visiting Physician Maryborough District Lunatic Asylum, Surgeon Queen's County Prison, Port Leix, Maryborough, Queen's Co.

1885 JENNINGS, ULICK A., M.D., Brigade Surgeon, M.S., Retired, Surgeon Military Prison, Park View, Cork.

† JEX-BLAKE, SOPHIA, M.D., M.R.C.P., Lecturer on Hygiene London School of Medicine for Women, Bruntsfield Lodge, Whitehouse Loan, Edinburgh.

1887 JOHNSTON, R. K., M.D., B.Ch., Junior Assistant Surgeon National Eye and Ear Infirmary, Ophthalmic and Aural Surgeon Steevens' Hospital, 22 Lower Baggot street, Dublin.

1886 JOYNT, C., M.D., Deputy Surgeon-General, Army Medical Staff, Retired, 21 Leeson Park.

1893 JOYNT, RICHARD LANE, M.D., Univ. Dublin, F.R.C.S., Assistant Surgeon Meath Hospital, 125 Lower Baggot-street, Dublin.

† KENNEDY, HUGH, B., L.R.C.S., 8 Great Denmark-street, Dublin.

† KENNY, JOSEPH E., M.P., L.R.C.P. Edin., City Coroner, 15 Rutland-square, Dublin.

1884 KIDD, FRED. W., L.R.C.S., Master Coombe Hospital, 17 Lower Fitzwilliam-street, Dublin.

† KIDD, GEORGE HUGH, F.R.C.S., M.D., late Master and Obstetric Surgeon Coombe Lying-in Hospital, Consulting Obstetric Surgeon to the House of Industry Hospitals, 30 Merrion-square, South, Dublin.

1889 KIDD, LEONARD, M.D., L.R.C.S., Carlton House, Enniskillen.

† KINKEAD, RICHARD JOHN, M.D., L.R.C.S., Lecturer on Medical Jurisprudence, Professor of Obstetric Medicine, Queen's College, Galway, Foster House, Galway.

† KNOTT, JOHN FREEMAN, M.D., F.R.C.S., late Demonstrator of Anatomy, School of Surgery, 34 York-street, Dublin.

1889 KYNSEY, WM. RAYMOND, C.M.G., F.R.C.P., L.R.C.S., Principal Medical Officer Colombo, Ceylon.

1885 LANE, JOHN LILLY, M.B., late Assistant Physician, Rotunda Hospital, Gynæcologist City of Dublin Hospital, 37 Lower Baggot-street, Dublin.

1884 LEDWICH, EDWARD L'E., L.R.C.S., Demonstrator of Anatomy Royal College of Surgeons, 31 Harcourt-street, Dublin.

1891 LENNON, EDWARD EMMANUEL, F.R.C.P., L.R.C.S., Senior Assistant Physician Meath Hospital, 30 Harcourt-street, Dublin.

† LENTAIGNE, JOHN VINCENT, F.R.C.S., Surgeon Mater Misericordiæ Hospital, 29 Westland-row, Dublin. [1]

† LITTLE, JAMES, M.D., F.R.C.P., Physician Adelaide Hospital, Ex-President Royal College of Physicians, 14 Stephen's-green, North, Dublin. [1]

1884 LUSH, WILLIAM VAWDREY, M.D., F.R.C.P. Lond., F.R.C.S. Eng., Physician to the Dorset County Hospital, 12 Frederick-place, Weymouth.

† MACAN, ARTHUR V., M.B., M.A.O., F.R.C.P., Professor of Midwifery T.C.D., 53 Merrion-square, Dublin.

1887 MACAUSLAND, RICHARD BOLTON, L.R.C.S., Surgeon Steevens' Hospital, 69 Fitzwilliam-square, Dublin.

† M'ARDLE, JOHN STEPHEN, F.R.C.S., Surgeon St. Vincent's Hospital and the Mullen Convalescent Home, 7 Merrion-street, Upper, Dublin. [2]

1889 M'BEIDE, CHARLES, M.D., F.R.S. Edin., Parochial Medical Officer, Wigtown, Scotland.

† M'CULLAGH, JOHN, L.R.C.S., Demonstrator of Anatomy Catholic University, Ireland, Surgeon St. Joseph's Hospital for Children, 18 Mountjoy-square, East, Dublin.

1887 M'CUTCHEON, A. K. F., L.R.C.P., L.R.C.S., Physician Whitworth Hospital, Drumcondra, 3 Rutland-square, Dublin.

1891 McDONNELL, HERCULES HENRY, M.D., M.Ch., Surgeon South County Infirmary, Dundalk.

1883 M'KEOWN, WILLIAM A., M.D., Surgeon Eye and Ear Infirmary, 20 College-square, East, Belfast.

† M'LAREN, AGNES, M.D., L.R.C.P., late Physician Canongate Medical Mission Dispensary, Bruntsfield Lodge, Whitehouse Loan, Edinburgh, and Cannes, France.

1887 MACNAMARA, P. J., M.D., F.R.C.S., Sarsfield's House, Kilmallock, Co. Limerick.

1887 M'WEENEY, E. J., M.D., M.Ch., Pathologist Mater Misericordiæ Hospital, 15 Ely-place, Dublin.

† MADDEN, THOMAS MORE, M.D., F.R.C.S., Edin., M.R.C.P., Obstetric Physician Mater Misericordiæ Hospital, Physician to St. Joseph's Hospital for Sick Children, 55 Merrion-square, South, Dublin. [1]

1883 MARQUES, L. PEREIRA, M.R.C.P., L.R.C.S., Medical Officer Victoria Gaol Hospital, late Superintendent Lock Hospital, Hong Kong, China.

1891 MARTIN, J. W., M.B., Surgeon-Major Army Medical Staff, 17 Northumberland-road.

† MARTIN, WILLIAM JAMES, M.D., F.R.C.P. Edin., Physician Jervis-street Hospital and St. Joseph's Infirmary for Children, 17 Harcourt-street, Dublin.

† MASON, SAMUEL ROBERT, M.B., F.R.C.S., Ex-Master Coombe Hospital, Professor of Midwifery Royal College of Surgeons, 22 Merrion-square, Dublin.

† MASON, THOMAS PETER, M.B., F.R.C.S., Physician Mercer's Hospital, 45 Harcourt-street, Dublin.

1885 MAXWELL, PATRICK W., M.D., Ophthalmic Surgeon Jervis-street Hospital, Assistant Surgeon National Eye and Ear Infirmary, 19 Lowe Baggot-street, Dublin.

† MELDON, AUSTIN, F.R.C.S., Ex-President Royal College of Surgeons, Surgeon Jervis-street Hospital, 15 Merrion-square, N., Dublin. [1]

1883 MIDDLETON, WILLIAM HENRY, L.R.C.S., Surgeon Westmeath Co. Infirmary, Mullingar, Co. Westmeath.

1885 MOLONY, JOHN, F.R.C.P., Master St. Patrick's Hospital for Lunatics, Dublin.

† MONTGOMERY, ALEXANDER NIXON, M.R.C.P., Secretary Vaccination Department, Local Government Board, 45 Upper Sackville-street, Dublin.

† MONTGOMERY, ROBERT, M.R.C.S. Eng., 4 Gardiner's-row, Dublin.

1894 MONTGOMERY, ROBERT JOHN, M.A., M.B., Univ. Dublin, F.R.C.S., 4 Gardiner's-row, Dublin.

† MOORE, CHARLES FREDERICK, M.D., F.R.C.S., Certifying Surgeon, Medical Inspector of Seamen, 10 Upper Merrion-st., Dublin.

† MOORE, JOHN WILLIAM, M.D., F.R.C.P., Physician Meath Hospital, Professor of Practice of Medicine Royal College of Surgeons, 40 Fitzwilliam-square, West, Dublin. [2]

† MOORE, ROBERT HENRY, F.R.C.S., Surgeon-Dentist-in-Ordinary to His Excellency the Lord Lieutenant, 29 Upper Merrion-street, Dublin.

† MOORE, WILLIAM, M.D., F.R.C.P., Physician to Her Majesty the Queen, 67 Fitzwilliam-square, North, Dublin.

1883 MURPHY, JOHN, L.R.C.S., Physician Mater Misericordiæ Hospital, 13 Merrion-square, Dublin.

† MURPHY, JOHN JOSEPH, L.R.C.P. Ed., 18 Harcourt-street, Dublin.

1886 MYLES, T., F.R.C.S., Surgeon Richmond Hospital, Professor of Pathology Royal College of Surgeons, 32 Harcourt-st., Dublin. [2]

1883 NEWELL, F. T. PORTER, M.D., Univ. Dub., F.R.C.S., Medical Officer No. 2 Dispensary, South Dublin Union, 18 Lower Baggot-street.

† NIXON, CHRISTOPHER J., M.D., F.R.C.P., Physician to Mater Misericordiæ Hospital, 2 Merrion-square, N., Dublin.

† NIXON, FREDERICK ALCOCK, F.R.C.S., Surgeon Mercer's Hospital, 33 Harcourt-street, Dublin. [1]

1889 NOLAN, MICHAEL JAMES, L.R.C.P., L.R.C.S., Resident Medical Superintendent Down District Lunatic Asylum, Downpatrick.

1885 NORMAN, CONOLLY, F.R.C.P., Medical Superintendent Richmond District Lunatic Asylum, Dublin.

1886 NORTON, JOHN J., L.R.C.P., Medical Officer Dispensary District, Leighlinbridge, Co. Carlow.

† NUGENT, GUY PERCIVAL L'ESTRANGE, M.D., F.R.C.P., Physician Richmond, Whitworth, and Hardwicke Hospitals, Registrar Royal College of Physicians, 19 Lower Fitzwilliam-street, Dublin. [1]

1887 O'CALLAGHAN, ROBERT THOMAS ALEXANDER, L.R.C.P., F.R.C.S., 137 Harley-street, London.

† O'CARROLL, JOSEPH FRANCIS, M.D., F.R.C.P., Physician Richmond, Whitworth, and Hardwicke Hospitals, 27 Westland-row, Dublin. [1]

† O'GRADY, EDWARD STAMER, F.R.C.S., Surgeon Mercer's Hospital, 33 Merrion-square, North, Dublin.

1883 O'KEEFE, PATRICK, M.D., Resident Medical Officer Mountjoy Convict Prison, Dublin.

1883 OLPHERTS, J. WYBRANTS, M.D., Medical Officer Downpatrick Dispensary District, The Villas, Downpatrick.

1883 O'NEILL, WILLIAM, M.D., M.R.C.P. Lond., Physician Lincoln Lunatic Hospital, 2 Lindum-road, Lincoln.

† ORMSBY, LAMBERT HEPENSTAL, M.D., F.R.C.S., Surgeon Meath Hospital, Surgeon National Orthopædic and Children's Hospital, 4 Merrion-square, West, Dublin.

1891 O'ROURKE, CHARLES T. J., L.R.C.P., L.R.C.S., Medical Officer, Crossakiel Dispensary, Co. Meath.

† O'SULLIVAN, STEPHEN, M.D., F.R.C.S., Professor of Surgery, Queen's College, Cork, Surgeon North Infirmary, 6 Camden-place, Cork.

† OULTON, HENRY W., M.D., L.R.C.S., Assistant Surgeon Dublin Metropolitan Police, 6 North Frederick-street, Dublin.

1893 PARSONS, ALFRED ROBERT, M.B., Univ. Dublin, F.R.C.P., Physician City of Dublin Hospital, 4 Upper Mount-street, Dublin. [1]

1889 PATTESON, ROBERT GLASGOW, M.B., F.R.C.S., Assistant-Surgeon Vincent's Hospital, 20 Lower Baggot-street.

† PATTON, ALEXANDER, M.B., Resident Physician Farnham House and Maryville Private Lunatic Asylum, Farnham House, Finglas, Dublin.

† PEARSALL, WILLIAM BOOTH, F.R.C.S., Surgeon Dental Hospital, 13 Upper Merrion-street, Dublin.

1887 PEARSON, CHARLES YELVERTON, M.D., F.R.C.S. Eng., Professor of Materia Medica Queen's College, 1 Sydney-place, Cork.

† PECHEY-PHIPSON, MARY EDITH, M.D., L.R.C.P., Cumballa Hill, Bombay.

1885 PETIT, JOSEPH, L.R.C.P., Medical Superintendent District Lunatic Asylum, Sligo.

1883 POPE, FREDERICK ALEXANDER, M.B., Medical Officer Throat and Ear Hospital, 90 Pembroke-road, Dublin.

† POLLOCK, JAMES FERRIER, M.D., F.R.C.P., Medical Officer Meath Industrial Schools, Avoca House, Blackrock.

† PORTER, SIR GEORGE HORNIDGE, Bart., M.D., F.R.C.S., Surgeon-in-Ordinary to the Queen in Ireland, Regius Professor of Surgery University, Dublin, Surgeon Meath Hospital, 3 Merrion-square, North, Dublin.

1885 POTTER, HENRY, F.R.C.S., Brigade Surgeon Indian Army, 33 Belgrave-square, Rathmines.

† PRATT, JOSEPH DALLAS, M.B., F.R.C.S., Surgeon Jervis-street Hospital, 25 Lower Fitzwilliam-street, Dublin. [1]

† PUREFOY, RICHARD DANCER, F.R.C.S., Obstetric Surgeon Adelaide Hospital, 20 Merrion-square, Dublin. [1]

† PURSER, JOHN MALET, M.D., F.R.C.P., Professor of Institutes of Medicine in the School of Physic, Physician Sir Patrick Dun's Hospital, 3 Wilton-terrace, Dublin.

† QUINLAN, FRANCIS JOHN BOXWELL, M.D., F.R.C.P., Physician St. Vincent's Hospital, Professor of Materia Medica and Therapeutics Catholic University, 29 Lower Fitzwilliam-street, Dublin.

1893 RAMBAUT, DANIEL FREDERICK, M.D., Univ. Dublin, Assistant Medical Officer, Richmond District Asylum, Dublin.

† REDMOND, JOSEPH MICHAEL, M.D., F.R.C.P., Physician to Mater Misericordiæ Hospital, Senior Physician to Cork-street Fever Hospital, 8 Clare-street, Dublin.

1890 RINGWOOD, JOHN, L.R.C.P., Medical Officer Kells Workhouse, and Fever Hospital, Kells, Co. Meath.

1891 ROBINSON, OLIVER LONG, L.R.C.P. Lon., M.R.C.S. Eng., Surgeon Army Medical Staff, 84 Upper Leeson-street.

1891 ROCHE, ANTHONY, M.R.C.P., L.R.C.S., Lecturer on Hygiene Catholic University Medical School, 91 St. Stephen's-green.

1892 RUTHERFORD, WILLIAM, M.D., F.R.C.P.Ed., Visiting Physician District Asylum, Ballinasloe.

† SCOTT, CHARLES MASON, L.R.C.S., Rockingham, Kingstown, Co. Dublin.

† SCOTT, JOHN ALFRED, M.D., F.R.C.S., Professor of Physiology, Royal College of Surgeons, 36 Lower Baggot-street, Dublin. [1]

1887 SCOTT, JOHN HARRISON, M.B., F.R.C.S., Surgeon Adelaide Hospital, Fitzwilliam square, Dublin.

1886 SMITH, ALFRED J., M.B., Assistant-Master Rotunda Hospital, 32 Lower Baggot street, Dublin. [2]

1889 SMITH, JAMES, L.R.C.P., F.F.P.S. Glasg., Snugville, Shankhill-road, Belfast.

† SMITH, WALTER GEORGE, M.D., President R.C.P., King's Professor of Materia Medica School of Physic, and Physician to Sir Patrick Dun's Hospital, 25 Merrion-square, Dublin. [1]

† Smyly, Sir Philip Crampton, M.D., F.R.C.S., Surgeon Meath Hospital, Surgeon to the Hospital for Throat and Ear Diseases, 4 Merrion-square, North, Dublin.

† Smyly, William Josiah, M.D., F.R.C.P., Master Rotunda Lying-in Hospital, Dublin.

† Stack, Richard Theodore, D.M.D., Harvard, F.R.C.S., Dental Surgeon Adelaide Hospital, Surgeon to the Dental Hospital of Ireland, 10 Westland-row, Dublin.

1891 Stawell, J. Cooper Lloyd, M.D., F.R.C.S., Medical Officer Bagnalstown Hospital, Bagnalstown, Co. Carlow.

1889 Stoker, William, F.R.C.S., Surgeon Jervis-street Hospital, Professor of Surgery Royal College of Surgeons, 34 Stephen's-green, North.

† Stoker, William Thornley, M.D., Vice-President R.C.S., Surgeon Richmond Hospital, Surgeon Swift's Hospital for Lunatics, 8 Ely-place, Dublin.

† Stokes, Sir William, F.R.C.S., Surgeon to the Queen in Ireland, Surgeon Meath Hospital, Professor of Surgery Royal College of Surgeons, 5 Merrion-square, North, Dublin.

† Story, John Benjamin, M.B., F.R.C.S., Surgeon St. Mark's Ophthalmic Hospital, 6 Merrion-square, N., Dublin.

1889 Story, W. G., M.B., B.Ch., House Surgeon St. Mark's Hospital, Lincoln-place, Dublin.

† Swan, Robert Lafayette, F.R.C.S., Surgeon Dublin Orthopædic Hospital, 32 Stephen's-green, N., Dublin.

† Swanzy, Henry Rosborough, M.B., F.R.C.S., Surgeon National Eye and Ear Infirmary, Dublin, Ophthalmic Surgeon Adelaide Hospital, 23 Merrion-square, North, Dublin.

1893 Symes, Wm. Langford, L.R.C.P., L.R.C.S., Dispensary Medical Officer, Kiltegan, Co. Wicklow.

1893 Symington, Johnson, M.D. Edin., Professor of Anatomy, Queen's Coll., 18 College-gardens, Belfast.

1885 Tait, Lawson, F.R.C.S. Eng., Surgeon Birmingham and Midland Hospital for Women, 7 The Crescent, Birmingham.

1887 Thompson, S. M., L.R.C.P., L.R.C.S., 34 Harcourt-street, Dublin.

† Thomson, William, F.R.C.S., Surgeon Richmond Hospital, 54 Stephen's-green, E., Dublin.

1892 Thunder, Edmund, L.R.C.S. & P., Newbridge, Co. Kildare.

1891 Tichborne, Charles Robert Clarke, LL.D., L.R.C.S., Professor of Chemistry, Pharm. Society, Ireland.

† Tobin, Richard Francis, F.R.C.S., Surgeon St. Vincent's Hospital, 59 Stephen's-green, Dublin.

1889 Todd, H. Ross, L.R.C.P., L.R.C.S., Medical Officer 10th District Croydon Union, Warlingham, Surrey.

1892 Truman, Claude A. P., L.R.C.P. Ed., Charnwood, Kendrick-road, Reading, Berks.

1891 TORNEY, T. H. SNEYD, L.R.C.P., L.R.C.S., 12 Upper Merrion-street.

† TWEEDY, HENRY COLPOYS, M.D., F.R.C.P., Physician Steevens' Hospital, 7 Clare-street, Dublin. [5]

1893 TWEEDY, ERNEST HASTINGS, L.R.C.P., L.R.C.S., Assistant Master, Rotunda Hospital, Dublin.

† USHER, ISAAC WILLIAM, L.R.C.S., Medical Officer Dundrum No. 1 Dispensary, Rathdown Union, Tudor House, Dundrum, Co. Dublin.

† WARD, MONTGOMERY ALBERT, M.D., F.R.C.S., Surgeon to Mercer's Hospital and to Maison de Santé, 19 Rathmines-road, Dublin.

† WHEELER, WILLIAM IRELAND, M.D., F.R.C.S., Surgeon City of Dublin Hospital, 32 Merrion-square, North, Dublin.

1889 WHITLA, WILLIAM, M.D., Physician Royal Hospital, Professor of Materia Medica Queen's College, 8 College-square, Belfast.

1883 WILLIAMS, DAVID MARK, L.R.C.P., M.R.C.S.E., Physician Liverpool Hospital for Consumption and Diseases of the Chest, 2 Hardman-street, Rodney-street, Liverpool.

1892 WILKINSON, JOHN B., L.R.C.S. & P., Assistant Surgeon Richmond Hospital, 5 Usher's-island, Dublin.

1893 WOODS, ROBERT H., M.B. Univ. Dub., F.R.C.S., Throat Surgeon Richmond Hospital, Upper Merrion-street, Dublin. [1]

1884 YOURELL, M. J., M.R.C.P., 26 Merrion-square, N., Dublin.

MEMBERS.

1892 BARKER, WM. OLIVER, L.A.H., Resident Medical Officer Grand Canal-street Dispensary, Dublin.

† BOYCE, JOS. W., M.B., Medical Officer Blackrock Dispensary District, Blackrock, Co. Dublin.

1893 BOYCE, C. E., L.R.C.P., L.R.C.S., 70 Lower Baggot-street.

1893 CAMERON, JAMES, M.B. Edin., Hampstead, Drumcondra, Dublin.

1887 COPE, GEO. PATRICK, L.R.C.P., L.R.C.S., late Assistant Resident Medical Superintendent, Richmond District Lunatic Asylum, Medical Officer No. 3 Dispensary District, South Dublin Union, 60 South Richmond-street.

1891 CREAN, JOHN J., L.R.C.S., Surgeon-Major Army Medical Staff, Dublin.

1892 DAY, J. MARSHALL, M.B. Univ. Dublin, Resident Medical Officer Cork-street Fever Hospital, Dublin.

† DELAHOYDE, J. O'CONNELL, L.R.C.S., Medical Officer No. 2 District, North Dublin Union, 55 Rutland-square, Dublin.

1891 DICKSON, EMILY WINIFRED, L.R.C.P., L.R.C.S., 78 Stephen's-green.

1889 DRURY, H. C., M.B., L.R.C.P., 16 Lower Fitzwilliam-street.

1891 ELLIOTT, W. S., M.B., B.Ch., Medical Officer of Constabulary, Malahide, Co. Dublin.

1891 FAGAN, PATRICK J., L.R.C.P., L.R.C.S., Demonstrator Catholic University Medical School, Cecilia-street, 31 North Frederick-street, Dublin.

1894 FLOOD, FREDERICK L., L.R.C.P., L.R.C.S., 63 Pembroke-road, Dublin.

1885 GIBBS, RICHARD, L.R.C.S., Medical Officer Coolock Dispensary District, Winstonville, Fairview, Co. Dublin.

1889 GOULDING, H. BENSON, L.R.C.P., Edin., F.R.C.S., 16 Rathmines-road.

1889 HEARD, R. L., M.B., B.Ch., late House Surgeon Monkstown Hospital, Eversley, Monkstown, Co. Dublin.

1883 M'DERMOTT, P. A., F.R.C.S., 85 Upper George's-street, Kingstown.

1892 M'GRATH, JAMES JOSEPH, L.R.C.S., L.A.H., 68 Lower Mount-street.

1894 MADDEN, R. R. MORE, L.R.C.P., L.R.C.S., 53 Merrion-square, Dublin.

1891 MAGUIRE, KATHARINE, M.B., B.Ch., 13 Upper Mount-street.

1885 RIDLEY, GEORGE P., L.R.C.S., L.R.C.P., Surgeon King's County Infirmary, Tullamore, King's County.

1890 SAVAGE, M. BURKE, L.R.C.P., Physician Extern Department Vincent's Hospital, 8 Rutland-square.

1885 SHAW, JAMES, L.R.C.S., 93 Talbot-street, Dublin.

† SPEEDY, ALBERT O., L.R.C.P. Ed., Medical Officer, No. 3 Dispensary District, North Dublin Union, 28 North Frederick-street, Dublin.

1884 STRAHAN, MICHAEL, L.R.C.S., Medical Officer, No. 2 North City Dispensary District, 38 Rutland-square, Dublin.

1892 TAYLOR, E. H., M.B., B.Ch. Univ. Dub., Assistant Surgeon Sir Patrick Dun's Hospital, 60 Upper Mount-street, Dublin.

1887 THOMPSON, W. H., M.D., F.R.C.S. Eng., Professor of Physiology Queen's College, Belfast.

1891 THOMPSON, WILLIAM J., L.R.C.P., L.R.C.S., 15 Harrington-street. [1]

† WHITE, WM. DUDLEY, L.R.C.S., Medical Officer, No. 3 Dispensary District, North Dublin Union, 51 Rutland-square, Dublin.

1887 WYNNE, GEO. NESBITT, M.D., M.Ch., 77 Aungier-street, Dublin.

STUDENT ASSOCIATES.

HARPER, ISABEL WANTYN, 4 Grosvenor-place, Rathmines.

LEVENSTON, ARCHER, 34 Longwood-avenue.

LYNAM, E., Dublin.

NUGENT, H. F., Dublin.

ROUGHAN, J. A., Dublin.

RULES.

1. The name shall be, "ROYAL ACADEMY OF MEDICINE IN IRELAND." (1887.)

Constitution.

2. The Academy shall consist of Fellows, Honorary Fellows, Members, and Student Associates.

Management.

3. The affairs shall be managed by a Council, consisting of the President, Ex-Presidents (1893), the six Presidents of Sections, the General Secretary and Treasurer, the Secretary for Foreign Correspondence, six Secretaries of Sections, and eight Councillors, being two representatives from the Medical, Surgical, Obstetrical, and Pathological Sectional Councils respectively.

Meetings.

4. The Meetings shall be General and Ordinary.

Publication of "Transactions."

5. The "Transactions" shall be published by the Council, subject to the provisions hereinafter contained.

Original Fellows and Members.

6. All the Members of the present Societies (Medical, Surgical, Obstetrical, and Pathological) shall be Original Fellows or Members, without entrance fee, on payment of the annual subscription on or before 31st December, 1882.[a]

Fellows.

7. Fellows of the King and Queen's College of Physicians in Ireland, and of the Royal College of Surgeons in Ireland, shall be admitted, without ballot, on payment of the entrance fee and the subscription for the current year. All others, being Registered Medical Practitioners not directly or indirectly engaged in the sale of drugs, shall be proposed by two Fellows, and elected by ballot by the Council.

8. Candidates shall be proposed at one Meeting of the Council, and balloted for at the next—one black bean in four to reject.

8A. That all Rules referring to the admission of Fellows, Members, and Student Associates shall be interpreted as referring to Ladies as well as Gentlemen.

Privileges of Fellows.

9. Fellows only shall be eligible for office in the Academy. They shall have the privilege of attending all Meetings of the Academy, of making Communications, and of voting and speaking at such meetings. They shall also receive a copy of the "Transactions."

[a] Those who have paid a Life Subscription to any of the above Societies will be admitted to the privilege of Fellows on payment of Member's subscription.

10. These privileges shall not be exercised by any Fellow in arrear with his subscription.

Honorary Fellows.

11. Honorary Fellows, limited in number to 25, may be nominated by the Council, and elected, on motion at a General Meeting of the Academy by a majority of at least two-thirds of those present and voting.

Members.

12. Any Registered Medical Practitioner may be elected as a Member, the election to be conducted in the same manner as that of Fellows.

Privileges of Members.

13. Members shall have the privilege of attending the Ordinary Meetings of the Academy, of making Communications, and of taking part in debate. They can purchase the "Transactions" at cost price.

Student Associates.

14. Registered Medical Students, of the third or subsequent years, may be elected as Student Associates in the same manner as the Members.

15. Student Associates shall have the privilege of attending the Ordinary Meetings of the Academy.

Annual Subscription.

16. Fellows shall pay £2 2s., and Members £1 1s. Student Associates shall pay 5s. The Subscription shall become due on the 1st of October in each year, and if the Subscription be not paid on or before the first Meeting in February, the defaulter shall cease to belong to the Academy, unless the delay shall be accounted for to the satisfaction of the Council. No Fellow shall vote at the Annual General Meeting who has not paid his subscription for the year. Medical Officers of the Army and Navy, and Registered Medical Practitioners not residing within 15 miles of Dublin, are eligible as Fellows of the Academy on payment of the entrance fee, and an annual Subscription of £1 1s.

Entrance Fee.

17. After admission of Original Fellows, all Fellows shall pay an entrance fee of £1 1s.

Council.

18. The Council shall meet on the first Wednesday in the month throughout the Session, or oftener should they see occasion—five to form a quorum.

19. Notice of all Extraordinary Meetings shall be transmitted by the Secretary to every Member of the Council. The President or any five Members of Council may call an Extraordinary Meeting of the Council. The Council shall determine questions by vote, or by division if so demanded, the President having a casting vote only. Any regulation of the Council shall have the force of a law, until submitted to the next General Meeting. The Council shall have the power of filling up any vacancies which may occur in the list of Officers of the Academy, except that of President, before the Annual General Meeting. If a vacancy in the office of President should occur, the General Council shall summon a Special General Meeting of the Academy to fill such vacancy. (1888.)

Sectional Councils.

20. There shall be six Sectional Councils elected by the Annual General Meeting in October, termed respectively—the Medical, the Surgical, the Obstetrical, and the Pathological, the State Medicine, and the Anatomical and Physiological Councils.

21. No Fellow shall be eligible as a candidate for election on more than two Sectional Councils, but no Fellow shall be eligible as a candidate for election on both the Medical and Surgical Sectional Councils. (1888.)

22. Each Sectional Council shall consist of the President of the Section and ten Members, one of whom shall act as Secretary to the Section; except the State Medicine and Anatomical and Physiological Councils, which shall each consist of a President and six Members. (1888).

Meetings of Sectional Councils.

23. Each Sectional Council shall meet on a fixed day at least one week before the Ordinary Meeting of their Section, three to form a quorum.

Powers.

24. Each Sectional Council shall have the power of making any such arrangements as it thinks necessary to carry on the work of the Ordinary Meetings which are under its charge, provided that such arrangements do not interfere with the general laws of the Academy; and any Rules laid down by such Council shall have the force of laws at the Ordinary Meetings under its charge, until submitted to the General Council.

25. Each Sectional Council shall have the power of filling up any vacancies that may occur among its Members until the Annual General Meeting.

Committee of Reference.

26. The Council shall appoint a Committee of Reference, to report upon morbid growths and other specimens exhibited before the Academy; of this Committee the Exhibitor shall, for the occasion, be a Member.

Officers.

27. A President, to be elected by the Annual General Meeting in October, and to hold office for three years.

28. The Presidents of the Colleges of Physicians and Surgeons for the time being shall be the Presidents of the Medical and Surgical Sections. The Presidents of the other Sections shall be elected by the Fellows at the Annual General Meeting, and shall hold office for two years. (1888.)

29. One General Secretary and Treasurer to be elected at the Annual General Meeting.

30. It is expedient that a fixed salary (of one hundred guineas) shall be paid yearly to the General Secretary in consideration of the fact that the editing of the "Transactions" is part of his duties.

31. One Honorary Secretary for Foreign Correspondence to be elected at the Annual General Meeting. (1888.)

32. The Councillors for each Section to be elected at the Annual General Meeting. Each Sectional Council shall elect two Members to act on the

General Council, except in the case of the Sections of State Medicine and Anatomy and Physiology. (1888.)

33. Two Members in each Sectional Council shall retire annually, and be ineligible for re-election for one year.

34. Six Secretaries, one for each Section, to be appointed by the Sectional Councils.

35. At all elections after the year 1882, any Fellow desirous of nominating a candidate for election shall, at least one fortnight before the Annual General Meeting, forward an application to the General Secretary to enter the name of such Fellow on the list of candidates for office, provided that the Fellow so nominated shall have consented to act. (1891.)

36. That all elections shall be by ballot.

Duties of Officers.

37. *The President* shall preside at the Annual and Special General Meetings and at General Council Meetings. In the absence of the President, the Chairman shall be appointed by the meeting. (1888.)

38. *The Presidents of Sections* shall preside at the Ordinary Meetings of the Academy, and shall also preside at the Sectional Council Meetings. In the absence of the President, the Chairman shall be appointed by the Meeting. (1888).

39. *The General Secretary* shall attend all General Meetings of the Academy and General Council. He shall take minutes of such meetings, to be read at the following meeting.

40. He shall receive and have charge of all papers intended for publication in the "Transactions" of the Academy, after they have been handed over to him by the Secretaries of the several Sections.

41. He shall, on receiving notice from the Secretary of a Section, send out to all the Members notices of the title or titles of the paper or papers for the next Ordinary Meeting, with the name or names of the authors, and, so far as possible, of the subjects for Exhibition, with the names of the Exhibitors.

42. He shall arrange for the Exhibition of specimens and the reading of papers, which are forwarded to the Academy by those who are absent, or are not members.

43. The General Secretary and Treasurer shall receive all moneys, and lodge the same in bank to the account of the Academy, and all cheques shall be signed by the Treasurer and one other Councillor.

44. The Accounts shall be audited by two Fellows, not Members of Council, to be appointed by the President at some meeting previous to the Annual Meeting.

Duties of Secretaries of Sections.

45. To attend the Meetings of the Council of the Section and the Ordinary Meetings of the Academy, under the management of said Council, and to take minutes at such meetings, to be read at the next following meeting of that Section.

46. To keep such papers as the Sectional Councils deem worthy of publication, for the purpose of handing them over to the General Secretary.

47. To inform the Secretary of the Committee of Reference of any specimens referred to that Committee, and to transfer the specimens to that Secretary.

48. To give notice to the General Secretary, one week previously to the meeting, of the titles of papers for the evening, the names of the authors, and, so far as possible, the objects for Exhibition, with the names of Exhibitors, so that the General Secretary may inform the Members.

Meetings.

49. The Annual General Meeting to take place on the last Friday in October, for the election of Officers and Members of Council, and for the general business of the Academy.

50. Due notice of the meeting shall be given by the Secretary to all members at least three weeks previously. (1891.)

51. No motion involving a change of these Rules shall be brought before this meeting except one week's notice thereof shall have been given by the Secretary to each Member.

52. The President may—and shall forthwith, on receiving a requisition signed by seven Fellows, at any time—on giving one week's notice, summon a Special General Meeting, for the consideration of particular business, the nature of which must be specified in the letter of summons convening the meeting, and at such meeting no other business can be transacted. In the event of the President being unable, from any cause, or declining, to summon a Special General Meeting of the Academy, it shall be in the power of the General Council to summon such meeting. (1888.)

Ordinary Meetings.

53. The communications to be submitted to the Ordinary Meetings shall be grouped under the following heads :—Medicine, Surgery, Pathology, Obstetrics State Medicine, and Anatomy and Physiology ; and the conduct of such meetings shall be in the hands of the several Sectional Councils, each Sectional Council to have the management of the Ordinary Meeting in rotation, as arranged by the General Council. (1888.)

54. The Ordinary Meetings shall be held on every Friday evening, from the first Friday in November until the last Friday in May, inclusive, at eight o'clock, except during the Christmas and Easter recesses.

55. All Fellows, Members, and Student Associates attending the meetings, shall write their names in the attendance book.

56. Any Fellow or Member may introduce two Visitors by cards obtained from the Sectional Secretaries.

57. Officers of the Army or Navy Medical Departments shall, on presenting their cards, be admitted to the Ordinary Meetings of the Academy.

58. No communication shall exceed twenty minutes in its delivery, nor any speech thereon ten minutes, except by permission of the Chairman. No one shall speak twice upon the same communication, except the author, who has the right of reply.

58 (*a*). A paper by any other than a Fellow or Member of the Academy shall not be read before the Academy unless the author of such a communication shall have obtained permission to do so from the Council of the Section before which the communication is proposed to be read. (1892.)

Ordinary Meetings.—Order of Business.

59. (1.) Chair to be taken at 8 30 p.m.

(2.) Chairman to read list of specimens, &c., exhibited by card, together with the names of the Exhibitors.

(3.) No Pathological Specimen shall be exhibited at any Section other than the Pathological and Obstetrical, except by card. This Exhibition shall not exclude any subsequent communication regarding it at the Pathological Section.

(4.) There shall be no Exhibition of Specimens by card in the Obstetrical or Pathological Sections.

(5.) Any member shall have liberty to exhibit any recent specimen at any of the meetings of the Obstetrical Section, provided it illustrates any question in gynæcology.

(6.) At the meetings of the Obstetrical Section recent specimens may be exhibited, and the President shall invite discussion thereon, provided that such exhibition of specimens or discussion, if any, thereon, must terminate at 9 o'clock, p.m., but that, if necessary, they may be resumed after the papers for the evening have been read and discussed.

(7.) Chairman to ask if any member has any observations to make or motion to propose relative to any living specimen on the List of Exhibition.

(8.) Chairman to call upon the author of the first paper on the list to read his paper.

(9.) Chairman to call upon members to discuss the paper, or, at his discretion, to take any other paper or papers on the list relating to the subject, and have the discussion subsequently on all such papers collectively.

(10.) When the last paper has been discussed, the Chairman to ask if any member desires to speak upon any of the specimens exhibited by card.

(11.) After the discussion upon any specimen, the Exhibitor has the right of reply.

Regulations regarding the Exhibition of Specimens by Card.

60. (1.) Any member may exhibit by card at any Ordinary Meeting, except at the meeting of the Pathological and Obstetrical Sections. At the meetings of the Pathological all specimens must be presented and described *viva voce*, and debate may be invited thereon.

(2.) Notice shall, if possible, be given to the General Secretary, or the Secretary of the Section, on or before the previous Ordinary Meeting.

(3.) Specimens must be in the room at 7 45 on the night of Exhibition.

(4.) Specimens for Exhibition by card shall be open for inspection at 8 p.m.

(5.) A card, containing all particulars for publication, shall be placed with the Specimen. Cards for this purpose are to be obtained from the Secretary.

(6.) The Exhibitor should be present, and he shall furnish further details if asked for.

(7.) Every Exhibitor shall submit the Specimen or Specimens on view to the Committee of Reference, if the meeting so decide.

Exhibition of Pathological Specimens.

61. No lengthened reference to treatment shall be allowed upon any Specimen, except by the express permission of the Chairman. Whenever it has been agreed that a Specimen exhibited at a Sectional Meeting of the Royal Academy of Medicine in Ireland shall be sent to the Reference Committee to report thereon as to its nature, the Exhibitor is to retain the custody of the specimen until he shall be summoned to a meeting of said Committee to be convened by its Secretary, on an early day, when he will attend and submit it for examination. (1889).

By-laws concerning "Transactions."

62. The "Transactions" shall consist of such Communications made to the Academy by or through Fellows or Members as may be deemed by the General Council suitable for publication; also, of discussions of importance or interest arising out of such Communications.

63. All Communications accepted by the Academy become the property of the Academy, but authors may also print their Communications, subsequent to the reading of the same before the Academy, in any publication in addition to the "Transactions." Papers shall be handed to the Secretary of the Section immediately after they have been read. (1891.)

64. The "Transactions" for the year shall be presented to all Fellows of the Academy who have paid their Annual Subscriptions.

65. The "Transactions" may be purchased by Members at cost price.

66. The Publication Committee of each Section shall meet not later than the Tuesday after each meeting of the Section, for the purpose of abstracting the proceedings—the abstract to be placed in the printer's hands on same evening, and forwarded to the editors of medical journals with the least possible delay. (1888.)

67. Contributors of papers are requested to send their papers to the Academy printer early enough to allow of their being put in type before the meeting, and read in proof. (1888.)

68. That on the evening of the day of meeting of the Sectional Council, when the papers for the next meeting have been decided upon, a circular be sent to each contributor informing him :—

(1.) That he is expected to be ready or else take his place at the bottom of the list.

(2.) That he must have an abstract ready with his paper, otherwise he will be noted in the published proceedings in such form as the Publication Committee think fit.

69. The General Council is empowered to defray the expenses in whole or in part of any illustrations which it may consider advantageous to the elucidation of the papers published by the Academy.

70. An abstract (prepared by the author) of each communication made at the Academy, along with a report of the discussions thereon, shall be furnished to the editors of such medical journals as may desire to publish them, and the authors of such communications shall be empowered to publish their papers *in extenso* in any periodical or periodicals they may think fit, such communications also to appear in the "Transactions," provided the Council consider them worthy of insertion.

Expulsion of Fellow or Member.

71. Expulsion of a Fellow or Member can take place only at a General Meeting of the Academy, on the motion of the Council, if two-thirds of the Members present shall vote for the same by ballot. Of such ballot the Council must give at least fourteen days' notice in writing to every Fellow of the Academy.

New Laws.

72. New Laws, or alterations in existing Laws, can be proposed only at the Annual General Meeting. Any Fellow proposing such alteration shall give notice to the General Secretary at least ten days before the General Meeting in October.

REPORT.

THE General Council beg to report that the number of Fellows for the Session 1892 was 242; of Members, 36; of Students, 12. The Fellows decreased by 7; the Members increased by 3, and the Students by 2.

The financial statement shows that, in addition to a sum of £596 2s. 4d. in 2¾ Government Stock, the Council have purchased £103 13s. 6d. of 2½ Government Stock. They have also carried out the desire expressed at the last Annual General Meeting, and have presented a grant of £15 15s. to the Royal College of Physicians, and a like grant to the Royal College of Surgeons, in order to provide to some extent for the expenses which attended the meetings of the Academy in the Colleges. The Academy has no liabilities, and, having provided for extra expenditure in the year and invested £100, there is a balance to credit of £20 13s. 6d.

In accordance with the resolution of the Academy, the Council reverted to the plan of reporting the discussions by shorthand writers. They were able to obtain the services of two gentlemen who, being medical students, have technical knowledge of the subjects debated, and the Council hope that their arrangements meet with the approval of the Academy.

The Council had before them an invitation from the President of the forthcoming International Medical Congress at Rome, inviting the Academy to nominate delegates to the meeting, and they accordingly selected the following Fellows:—In Medicine, Dr. J. M. Finny; in Surgery, Sir William Stokes; in Obstetrics, Dr. W. J. Smyly.

Owing to the vacancy caused among the Trustees of the Academy's Funds by the death of Dr. Robert MacDonnell, the Council selected Dr. W. G. Smith, President of the Royal College of Physicians, to act in his stead, and the necessary changes have been made.

The funds are invested in the names of Dr. G. F. Duffey, Dr. W. G. Smith, and Mr. W. Thomson.

G. H. KIDD, *President.*
W. THOMSON, *General Secretary.*

General Treasurer's Report for the Session 1892–93.

RECEIPTS.

	£	s.	d.
To Balance in Bank	76	16	6
„ Subscriptions	477	16	0
„ Dividend on £596 2s. 4d., 2¾ Consols	15	19	0
„ „ £103 13s. 6d., 2½ Govt. Stock	1	19	0
„ Fannin, Share for Illustrations	1	14	0
Due to Treasurer	0	0	3
Total	£574	4	9

EXPENDITURE.

	£	s.	d.
General Secretary	105	0	0
Grant to Royal College of Surgeons	15	15	0
Grant to Royal College of Physicians	15	15	0
Invested in 2½ Government Stock	100	0	0
Milk, 1891–92	2	16	8
Fannin & Co., Printing Vol. X.	157	0	0
Trays, Fletcher & Phillipson	2	6	3
Illustrations, Vol. X.	12	16	3
Stationery, &c.	5	9	10
Reporters	28	7	0
Attendance	20	10	0
Groceries	17	17	6
Milk	2	19	4
J. Falconer, Printing	10	16	0
General Advertiser, Printing and Postage	55	5	9
Postage and Sundries	0	12	6
Cheque Book	0	4	2
Balance in Bank	20	13	6
Total	£574	4	9

We have examined the Treasurer's Statement of the Accounts of the Royal Academy of Medicine for the Session 1892-93, and we find it correct.

G. P. L. NUGENT.
A. W. W. BAKER.

October 27th, 1893.

WM. THOMSON, *General Secretary and Treasurer.*

Volume XII. of the "Transactions" has been forwarded to the following:—

Lancet	London.
British Medical Journal	Do.
Medical Press	Dublin.
Hospital Gazette	London.
Dublin Medical Journal	Dublin.
London Medical Recorder	London.
Edinburgh Medical Journal	Edinburgh.
Glasgow Medical Journal	Glasgow.
Liverpool Medical Journal	Liverpool.
Bristol Medical Journal	Bristol.
Asclepiad	London.
International Medical Journal	Do.
Annals of Surgery	Do.
Provincial Medical Journal	Leicester.
Birmingham Medical Review	Birmingham.
Sanitary Record	London.
Practitioner	Do.
College of Surgeons	Dublin.
Do.	London.
Do.	Glasgow.
Trinity College	Dublin.
Royal University	Do.
Queen's College	Belfast.
Do.	Galway.
Do.	Cork.
Royal Dublin Society	Dublin.
College of Physicians	Do.
Do.	Edinburgh.
Do.	London.
Faculty of Physicians and Surgeons	Glasgow.
Victoria University	Manchester.
University College	London.
Harveian Society	Do.
Pathological Society	Do.
Clinical Society	Do.
Medical and Chirurgical Society	Do.
Apothecaries' Hall	Do.
King's College	Do.
University	London.
Do.	Glasgow.
Do.	Edinburgh.
Do.	Durham.
Do.	St. Andrews.
Do.	Aberdeen.
University College	Dundee.
Do.	Melbourne.
Do.	Sydney.
Do.	Adelaide.

University College	Calcutta.
Do.	Bombay.
Do.	St. Petersburg
Do.	Paris.
Do.	Vienna.
Do.	Berlin.
Do.	Brussels.
Do.	Bologna.
Do.	Madrid.
Do.	Amsterdam.
Do.	Christiania.
Do.	Stockholm.
Do.	Toronto.
Do.	Quebec.
Do.	New York.
Do.	Philadelphia.
Do.	New Zealand.
Do. Library	Tokio, Japan.
Medical Institute	Birmingham.
Dr. Ashby	Do.
Director-General Billings	Washington, U.S.
Journal de Médecine et de Chirurgie (M. Lucas Championière)	Paris.
Archives de Chirurgie	108 Boulevard St. Germain, Paris.
Archiv für Klinische Chirurgie	Berlin.
Centralblatt für die medicinischen Wissenschaften	Do.
Zeitschrift für Chirurgie	Do.
The Australian Medical Gazette	Sydney, N.S.W.
New York Medical Journal	72 Fifth Avenue.
Journal, American Medical Association	Chicago.
Bulletin de l'Académie Royale de Médecine de Belgique	Brussels.
Medical Journal	Brooklyn.

Naturforschende Gesellschaft, Dr. Rudolf Martin, Seefeldstrasse 119, Zurich.
Academy of Medicine, 17 West 43d Street, New York.
Library, College of Surgeons, Edinburgh.
" British Medical Journal, 429 Strand, London.
" Medico Chirurgical Society, Bristol.
Sheffield Medical Journal, 17 Eyre Street, Sheffield.
Archives Cliniques de Bourdeaux, 46 Cours du Jardin-public, Bordeaux
Medical Society of Victoria, Melbourne (Meyer and Metzler, Great Portland, Street, London).
Quarterly Medical Journal, Dr. Coching, 277 Glossop-road, Sheffield.
Medical Library Association, 19A & 1 Stout Street. Denver, Colorado.
Charlotte Medical Journal, Charlotte, N. C., United States.
Society of Medicine, care of Dr. J. V. Wichman, Copenhagen.

F. Huth, Lith. Edin.

Dr. H. C. TWEEDY ON WARTY DISEASE OF LEGS.

BOSTON MEDICAL
DEC 3 1898
LIBRARY.

TRANSACTIONS

OF THE

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

A CASE OF WARTY DISEASE OF THE LEGS.

By H. C. TWEEDY, M.D., Dubl.;
Fellow and Examiner, Royal College of Physicians;
Physician to Madam Steevens' Hospital.

[Read in the Section of Medicine, November 17, 1893.]

Apart from morbid conditions of the skin which are essentially warty in their nature, there is a tendency in certain more or less common affections of the skin, when they have attained a certain degree of chronicity, to a general thickening of the integument, and a more special development of the papillary layer. This may be seen occasionally as a secondary change in eczema, where, in some cases, hypertrophy of the papillæ takes place, and a diffuse warty condition follows. A similar warty hypertrophy is sometimes met with in psoriasis, and more commonly still in lichen planus and in elephantiasis; in fact, any chronic inflammatory process in the skin, especially syphilis, is liable to take on a papillary character.

The case here detailed may be taken as a good example of this. His history is as follows:—

CASE.—A. B., aged fifty, employed as groom in the stables of the Tramway Company, Inchicore, came to me on the 30th August, 1893, to be treated for sore and swollen legs.

He had contracted syphilis fourteen years previously; sore throat had followed, and he also described spots on his body and legs; the legs swelled subsequently, and little "blobs," as he called them, formed and broke, leaving ulcers. The swelling in his legs, according to his statement, never went down, but was constantly bursting out and discharging an evil-smelling humour.

On admission to Steevens' Hospital the first thing that was apparent on uncovering his legs was the intolerable stench that proceeded from them. Both legs were swollen below the knees—the left for about one-third of the way down, and the right in its upper half. The swelling ended abruptly in a sharp line like a cicatrix, which extended, in the case of both legs, upwards and outwards. Below this line, and reaching to the ankles, the legs presented a dirty, sodden appearance, of a bluish grey colour, and were almost completely covered with dense horny crusts, which could be easily detached with the nail from the greatly elongated papillæ, which they covered as with a sheath, and which were readily separated with a probe. The skin as it approached the ankles became much thicker, the warts were smaller, drier, and more closely packed together, and the surface marked with deep transverse furrows or indentations; the whole ended in deep folds, corresponding in position to the external malleoli of both legs, and roughly mapping out in outline the ankle-joints. The feet were swollen, cyanosed, and œdematous, but beyond this the skin presented no further peculiarities.

On the calf of each leg, above the cicatricial line before alluded to, were a few scattered papules and tubercles, raised above the surface of the skin, of a dusky purplish hue, and covered with very fine scales. There was also a large plaque of the same character in the right popliteal space.

As far as could be seen there was no exudation from between the crusts, and the smell evidently proceeded from decomposing epithelium retained between the elevated papillæ, as cleanliness and an antiseptic lotion quickly banished it, and it did not return.

A mixture containing Donovan's solution and potassii iodidum

was ordered for him, and, as a local application, a dusting powder consisting of salicylic acid, sulphate of copper, and powdered savin, and he made decided progress during the short time he remained in hospital—one of the tubercles mentioned as on the right leg commencing to undergo retrogression, which caused it to assume a circinate appearance, and another becoming completely atrophied; a large patch of the warts also disappeared; but he was unfortunately obliged to leave owing to the illness of his son.

While the patient was in hospital my friend and colleague, Dr. MacDowel Cosgrave, kindly photographed him for me, and his excellent representations, now exhibited, show the condition of the legs with great clearness. At this time, in consequence of resting in bed, the swelling of the upper portion of the legs and of the feet had greatly subsided, but the following interesting points can be seen with much distinctness in the photographs:—

1. The dense masses of warts on the front and back of the legs, and the sharp lines of demarcation above and below.

2. On the right leg, above the ankle, a comparatively smooth region, where the warts had been cleared away while in hospital.

3. On the calf of the right leg, one of the tubercles in process of retrogression, the centre of the tubercule undergoing absorption; and lower down on the same leg a pigmented spot, in which the absorption had been completed.

At first sight the following description of lichen planus verrucosus, taken from Crocker,* seemed to give a perfect picture of the disease. He says:—"When the disease (lichen planus) has existed for a long time—and it *may* last an indefinite number of years if untreated—the papular part clears up, leaving the patches to undergo great thickening, usually aggravated by scratching; the papillæ enlarge, and are covered with dense horny crusts, so that the whole has a warty aspect, but usually of a dirty lilac hue. This is speci-

* Diseases of Skin. H. Radcliffe Crocker. 2nd edition. P. 268.

ally likely to happen on the lower part of the leg, but may occur in any part of the lower limb, infiltration sometimes extending over a large part of the thigh."

But, giving due weight to the history of the case, I cannot but think that the disease is of syphilitic origin, for the following reasons:—

1. The undoubted history of syphilis fourteen years ago, followed by ulceration of the legs.

2. That the legs have never been well since that time.

3. It is admitted that morbid processes like syphilis, lupus, eczema, &c., are liable to develop papillary growths; and though much prominence has not been given to this fact by the more modern writers, still some weight must be given to the statement of Erasmus Wilson[a] that "without referring to the papillary growths of early syphilis (condylomata), which could scarcely be confounded with simple warts, on account of their position and moisture, mention may be made of the dry, warty character assumed by old syphilitic lesions, *especially such as have been preceded by ulceration.*"

Lastly, the situation of the tubercles on the back of the leg. The infiltration of the tissues, the colour, as of raw ham, and the readiness with which they began to respond to potassii iodidum, as evidenced by the commencing retrogression already alluded to, strengthen me in the opinion expressed, that this particular warty condition of the legs is only another manifestation of syphilis, although it is a manifestation but seldom met with to the same marked extent.

In Piffard's "Diseases of the Skin," p. 84, is a photograph of a case of elephantiasis somewhat resembling the case here described; but in Piffard's case (which is one of elephantiasis of the right leg) there is the characteristic thickening of the whole limb from the hip down, and though there is extensive

[a] Quain's Dict. of Med. Art. Verruc. P. 1745. Ed. 1888.

ulceration over the internal malleolus, there is an absence of the warty growths, which were so characteristic in the case I have detailed.

Dr. W. G. Smith said that he thought the diagnosis of the disease as a syphilitic lesion was an open question. He would be inclined to class it as a case of "elephantiasis," remembering the loose way in which that term was applied.

PERNICIOUS ANÆMIA.

By JAMES CRAIG, M.D. Univ. Dubl., F.R.C.P.;
Physician to the Meath Hospital.

[Read in the Section of Medicine, November 17, 1893.]

A case has recently come under my observation in the Meath Hospital, presenting in such a marked degree the clinical features which characterise pernicious anæmia, that I have come to regard it as an example of that obscure and rather rare disease. While hunting up the literature of the subject, in my endeavour to become acquainted with the most recent views as to its causation and pathology, I was surprised to find that on two occasions only communications on this disease had been brought before the Fellows and Members of this Academy of Medicine. One was made by Dr. Finny in 1884, and the second by Dr. W. R. Graves in 1889, the latter merely embracing a few pathological results which he had observed. Previously to that the Irish literature dealing with this affection was confined, as far as I can gather, to a very able paper by Dr. Purser, published in the *Dublin Journal of Medical Science* for 1877; and a lengthy and exhaustive lecture delivered by Dr. Finny in the City of Dublin Hospital, and published in the *British Medical Journal* of 1880.

If this case which you have had the opportunity of examining were one of every-day occurrence, I should have preferred to wait before making my communication until either a more satisfactory result of treatment could have been recorded, or, in the event of a fatal termination, definite pathological results described. But as neither of

these conditions is likely soon to be fulfilled, I thought the present occasion not an inopportune one for a discussion of the subject. And in reading this paper I must ask for your kind forbearance if I weary you with a minuteness of detail which would be superfluous in the case of a less obscure illness :—

Case.—W. W., forty-two years of age, residing in Dublin, an upholsterer by trade, was sent to me by his employer on the 5th of September last. He complained that he lost his breath while walking, got weak and faintish while at work, and giddy when he raised his head after stooping. Family history excellent, has been married for 22 years, and has eight children alive. Had scarlatina when a boy, and typhus fever 11 years ago. Was never abroad. Had a bubo, 15 years ago, which did not suppurate, and was not accompanied by rash or sore throat. Never suffered from jaundice, nor passed tape-worm. Has suffered from piles, with occasional hæmorrhage for the last 18 years. About 6 years ago was much troubled with pain in the stomach and flatulence, which were relieved by the daily use of essence of ginger.

Some four years ago he first began to get breathless when walking on the street, and at that time he obtained admission to Steevens' Hospital, where he remained under treatment for several months. His symptoms having subsided, he went from there to the Convalescent Home at Stillorgan, from which place he returned to his work, feeling stronger and in better health. This improvement continued for about 12 months, when the breathlessness returned, and his skin became "pale and yellowish." He attended a dispensary in Mark-street off and on during the next 18 months, until in the February of the present year he became a patient in the Whitworth Hospital, Drumcondra. While there he improved somewhat, and again went to the Convalescent Home, but on resuming work he soon began to suffer as previously from weakness and shortness of breath. These increased until he came into the Meath Hospital in September. He has never had epistaxis; has suffered for some years from occasional attacks of diarrhœa, but not from vomiting. About 7 months ago, once or twice a week, he became very hot at night and perspired freely. Three months ago he says his mouth was covered with white blisters. About a year ago he noticed his urine was darker than at present.

On admission his face was of a pale lemon colour; the skin dry, smooth, and waxy; areola around nipple not dark; no enlargement of glands. Mucous membrane of lips and gums very pale; finger-nails excessively white; veins on backs of hands of magenta tint; conjunctiva of a bluish white colour. Body well nourished and covered with an abundance of subcutaneous fat; no œdema; respirations 24 per min.; no cough; lungs healthy. Heart is of normal size; a hæmic murmur is audible at apex, and more distinct over pulmonary area; a loud venous hum is heard over vessels in right side of neck; pulse 96, weak and compressible. The tongue is very pale, smooth, moist, and flabby, but clean; appetite is bad; diarrhœa is present; fæces dark with offensive smell; flatulence troublesome; abdomen tympanitic; no tumour. Splenic dulness slightly increased; liver normal in size; urine normal in amount and colour, sp. gr. 1019, acid with no albumen. Temperature normal, sees well, sleeps well, but is very apathetic and answers questions slowly.

A diagnosis was not arrived at as to the cause of the anæmia, although phthisis and malignant disease were excluded, and he was ordered 4 m. doses of liq. arsenicalis, and half-drachm doses of aromatic iron mixture to be taken thrice daily. The diarrhœa, which lasted for two days, was stopped by lead and opium pills. His breathlessness became less, and he was sent for a fortnight to the Convalescent Home in Bray, his medicine being still continued. On the 17th Oct. he returned to hospital and complained that he had gone back in his improvement, and was now as breathless as on his first admission. A diagnosis of pernicious anæmia was suggested, and accordingly an examination was made of a drop of blood drawn from his finger. It was pale and thin, and did not clot. The microscope revealed no excess of leucocytes, but the red corpuscles were few, and were either lying singly or collected in clusters. Some were normal in shape and size, but the majority were smaller than normal, and of great varieties of shape. Some were larger and paler than in health. The red cells were then counted by the hæmocytometer of Gowers, and numbered 1,700,000 instead of 5,000,000 to the cubic millimetre, or 34 per cent. of the normal. The amount of hæmoglobin was also determined, and was only 18 per cent. of that in health. He was put on 25m. of liq. arsenicalis daily, and his diet was restricted to 3 pints of milk daily with an egg each morning, and rice twice daily.

The blood was again examined on Nov. 4th, and the corpuscles

had increased to 2,280,000 per c.mm., or 45 per cent. of the normal number.

A further examination was made on Monday last, the 13th November, and although the alterations in shape were not so marked as when first examined, the red corpuscles were only 2,000,000 to the c.mm., or 40 per cent. of the normal, and the hæmoglobin was still only 20 per cent. of that found in health. There was no tenderness on tapping over the sternum or long bones.

As the presence of piles, which were said to bleed occasionally, pointed to a probable cause of the anæmia, I asked Sir William Stokes to make a rectal examination of the patient, which he kindly did, with the result that three small sessile piles, about the size of red currants, were found an inch or more above the anus, and although these did not themselves bleed, the passage of the speculum caused slight oozing from the relaxed mucous membrane below them. The urine was collected on several occasions and averaged between 50 and 60 ozs. I have to thank Dr. Lapper for a careful analysis which he has made of the total amount passed during 36 hours on Nov. 4th and 5th. He found the urine of normal colour, very acid, sp. gr. 1019. Urea amounted to 1·1 per cent., or 301 grs. per diem. The total sulphuric acid passed daily as sulphates was 30·73 grains, of which 14·35 grains were in the form of inorganic sulphates, and 16·38 grains were united with indol, phenol, and skatol, and appeared as aromatic sulphates.

These aromatic sulphates amount normally to about four grains daily, and are only one-tenth of the amount of inorganic sulphates, whereas you will observe in this case Dr. Lapper has found their amount to exceed that of the inorganic sulphates, the proportion being gr. 1 inorganic, to 1·14 grs. aromatic. It was therefore evident that indigogen compounds were present in abundance, and the specimen of indigo blue which I hand round was obtained from 3 ozs. of

urine by adding an equal quantity of pure HCl, and then carefully adding a few drops of a hypochlorite of calcium solution, and finally shaking up with chloroform and evaporating. Iron was not present. Urobilin could not be detected to any very appreciable extent, and ptomaïns were not examined for.

The temperature has been taken daily since his return to hospital, and although it never reaches 98° F. in the morning, it rises to 99° F. each evening, and on two occasions to 100° F. Since his re-admission he has only once complained of looseness of the bowels, and on examining the fæces they were semi-fluid, alkaline, and slightly darker than normal, but not markedly offensive, and without a trace of blood.

His eyes were examined, but, being unable to detect any retinal hæmorrhages, Mr. Story very kindly undertook a careful examination for me, and he found that the retinal vessels were very pale, but that no evidence of hæmorrhages existed.

I cannot say that up to the present there has been any great improvement in the condition of the patient, although arsenic has been administered very freely. He says that he is not so breathless as before when he walks up and down the ward, and although I have lately noticed a tendency to a tinge of pink near the free margins of the nails, an examination of the blood has not revealed any increase of red corpuscles or hæmoglobin to account for this. Dr. S. Mackenzie has pointed out that a universal pallor of the nails is an evidence that the corpuscular richness of the blood has decreased by 50 per cent.

In my further remarks you will have an opportunity of observing in what respects the clinical features of this case correspond to the recognised symptoms of the disease which I have assumed this to be, and in what instances they differ.

The obscure malady to which the name of Pernicious Anæmia has been ascribed has occupied for the last quarter of a century a considerable amount of attention from the medical profession both in the United Kingdom and on the Continent. True that a few scattered cases had been published before 1855, but at that date Addison first made known the fact that he had long been aware of a fatal form of anæmia, which came on slowly, resisted all treatment, and for which no cause could be assigned. He termed it Idiopathic Anæmia; and when, sixteen years later, Biermer, of Zurich, published what he thought was a new disease, he called it Progressive Pernicious Anæmia, but it was in reality the same complaint which Addison had already described, and a number of which like cases had been under the care of him and his colleagues in Guy's Hospital in the intervening years. This claim of priority for the German physician in describing a new disease—a claim to which he had no just right—has caused as much annoyance to the colleagues and successors of Addison as was caused in our own country when the Germans gave to Basedow the honour of having first discovered the disease which, five years previously, had been described by Graves, and with which his name will be for ever linked.

But while the honour of discovery undoubtedly rests with Addison, the title of Idiopathic Anæmia with which he named this malady, has come to be regarded in a wider sense, and to include both chlorosis and pernicious anæmia, which are considered as primary ailments as distinct from those anæmic conditions which are simply symptomatic. The title of "Progressive Pernicious Anæmia" adopted by Biermer is now shortened to Pernicious Anæmia, as it has been found that the disease does not in all cases assume a progressive nature, but is often characterised by relapses and sometimes even by cure.

The symptoms indicative of this disease are numerous, and in most cases the illness creeps on the patient in a slow and insidious manner. Distressing breathlessness may be the only thing complained of for a length of time, but increasing weakness, pallor of the skin and mucous membranes, and in the case of the face a yellow, lemon, or faded leaf-tint, are soon noticed. The superficial veins on the backs of the hands have been observed by M'Phedran, of Toronto, to have a magenta tinge rather than the normal blue. While general weakness increases there is no wasting to correspond, but rather an increase in the amount of subcutaneous fat, which, however, may disappear towards a fatal termination. Stomatitis, vomiting, and diarrhœa are usually present, one or other or sometimes all of them being prominent, and in the case of the diarrhœa it is often of an unusually offensive character. The tongue is pale, flabby, and clean, but at times coated or raw-looking. The appetite is bad, and flatulence, with pain in the epigastrium, is present. Hepatic dulness is slightly increased. The lungs are healthy. The heart is often slightly enlarged from fatty degeneration and probably dilatation—hæmic murmurs at apex and base are common, with a venous bruit in the neck. The pulse is quick and compressible, though sometimes high tension has been noted. Hæmorrhages into the retinæ are invariably present, while epistaxis, bleeding from the gums, metrorrhagia, and even petechiæ, are not uncommon. Œdema around the ankles has been noticed. Tenderness over some of the bones has been observed.

In 1874 Professor Immermann, of Bâle, observed that pyrexia without local inflammation was an important character of "the new disease," and in the same year a case of Dr. Moxon's is recorded in "Guy's Hospital Reports" (1878), in which rigors, sweating, and high temperature occurred. Further investigations have proved that this

pyrexia, rarely absent, is irregular or remittent in its course, and indeed it has been taken by Dr. William Hunter as a sign that active destruction of blood is going on when the temperature rises, and he says that at such times also there is a deeper tint of the skin and a darker colour of the urine. However, although irregular fever is common and well-marked in pernicious anæmia, we should remember that pyrexia has been observed in anæmia from excessive hæmorrhage, and commonly, to a slight degree also, in chlorosis.

In 1875 changes were discovered in the medulla of the long bones, to which I shall refer later on.

A microscopic examination of the blood was made by Wilks and others in Guy's Hospital even in the earliest-recorded cases, but save that the leucocytes were not increased, little else was observed. Leared, it is true, wrote in 1858 that the blood discs varied in size and shape. However, it was not until 1875 that Dr. Byrom Bramwell made drawings of the appearances presented by the blood when examined with the microscope, and these drawings were published two years later in the *Edinburgh Medical Journal.* In the meantime Professor Eichhorst, of Jena, had independently discovered the remarkable changes which are seen in the red corpuscles, and Quincke gave a translation of his description in the *Medical Times and Gazette* of Oct., 1876. In the following month Messrs. Mackern and Davy demonstrated similar changes from the blood of a patient in Guy's Hospital, and nine months later Professor Purser was fortunate enough to meet with a case in which the corpuscular characters of the blood were most minutely observed and recorded by him. Dr. Stephen Mackenzie, in the *British Medical Journal* of 1891, after mentioning that in this disease the sp. gr. of the blood is reduced from 1050 to 1038 or 1028, that its alkalinity is lessened, and that the solids of the plasma are greatly diminished, classifies the

alterations that have been noted in the red corpuscles under six heads—1. Their cohesiveness is modified, so that rouleaux are seldom seen, and the corpuscles are either arranged singly or collected in clusters. 2. They are greatly reduced in number; instead of averaging 5,000,000 to the cubic millimetre, their number may fall to 1½ millions, or sometimes, even before death, to 360,000. 3. Poikilocytosis, or alterations in the shape of the corpuscles, though found occasionally in chlorosis and other anæmic affections, and though sometimes absent in this disease, is very marked. Some of the cells are the normal biconcave discs, but the majority are ovoid, pear-shaped, battledore, rod-shaped, cup-shaped, or, finally, of irregular outline. 4. Their size presents great variations; large numbers of small cells are seen—microcytes, and this condition, though present in all varieties of anæmia, is more common in pernicious than in the other forms. On the other hand, megalocytes, or cells larger than the ordinary ones, are especially characteristic of this disease. Nucleated red corpuscles have also been occasionally observed. 5. The vulnerability of the corpuscles is increased—in other words, they more readily give up their hæmoglobin. This is proved by observing with the microscope the colouring matter separating from the stroma, and by noting that in a few hours crystals of hæmoglobin form in a drop of blood placed on a slide without any reagent being added, as shown by Copeman, but this latter condition was not found by Mott. 6. The hæmoglobin capacity of the red corpuscles is greatly increased. This, I do not think, has been sufficiently verified from the recorded cases to entitle it to be given as a definite statement. Numerous instances are doubtless recorded where the percentage of corpuscles had fallen to 30 or 40, while the hæmoglobin was still present to 60 or 80 per cent. In these cases the corpuscles represented twice their normal value, but also in

a great number of cases the value of the coloured cells had only been one-half of the proper amount, and this latter condition is what my patient's blood represents. However, when a comparison is made with chlorosis in this respect, a marked difference exists. In chlorosis a great deficiency in hæmoglobin, out of all proportion to the number of cells, which, indeed, may be only slightly decreased, is a special characteristic of the disease, while in pernicious anæmia the hæmoglobin bears a more equal relation to the number of cells, and is often greater individually than in health.

In addition to the characters of the blood just enumerated, one observes, from a drop on the finger, its pallor, thinness, and tendency to run off the finger rather than to clot.

With regard to the urine, it has been found normal in amount, of low sp. gr., acid in reaction, deficient in urea, and generally free from albumen, bile, and sugar. In many cases its colour is of the usual amber tint; in others it has been found darker than that of health. But of late years much importance has been attached to the discovery of the following additional characters—namely, excess of iron, increased and abnormal urine pigments, blood pigment, increase of the aromatic sulphates, and finally the presence of ptomaïns. And these conditions I shall now briefly consider in detail, and endeavour to point out the significance attached to their presence and the causation theories adduced therefrom.

In the case recorded by Dr. Purser he had noticed that the urine during life was darker than normal, and on finding after death that the epithelium of the convoluted tubes in the kidneys contained a granular pigment which gave an iron reaction, he greatly regretted that he had omitted to examine the urine for iron, for he concluded that the iron pigment present in the kidneys was derived from the blood, that it was undergoing elimination through the renal convoluted tubes, and thus darkened the urine by its presence.

This suggestion was subsequently acted on by Dr. Finny, and it was found that one of his patients, while not under treatment by iron, had eliminated about one-third of a grain of this metal in 72 ounces of urine. This, of course, pointed to an active blood destruction, but by taking into consideration the altered appearance of the red corpuscles, and from the definite changes which had been observed by Cohnheim and himself in the medulla of the long bone—a change in which the yellow fat was replaced by a variety of coloured and colourless corpuscles—Dr. Purser arrived at the conclusion that probably an imperfect formation, and almost certainly an increased destruction of the red corpuscles, takes place in the bone-marrow. Professor Pepper, of the University of Pennsylvania, had first observed the abnormal appearance of the bone-marrow, and had put forward the theory that pernicious anæmia was merely a medullary form of Hodgkin's disease.

However, an advance towards a fresh theory was made when Dr. William Hunter, acting on the discovery that in many cases the liver-cells of the portal area were deeply stained by iron re-agents, made a quantitative estimate of the amount of free iron contained in the liver and spleen. The normal amount he found to be ·083 per cent. in the liver, and ·171 per cent. in the spleen after these organs had been freed from blood. On the other hand, in pernicious anæmia he found that the liver contained more than seven times as much as in health, while the normal quantity was scarcely reached in the case of the spleen. In other words, the liver, which in health yielded only one half of the amount obtained from the spleen, contained three times the splenic amount in the disease under discussion. Dr. Hunter, therefore, concluded that an active destruction of blood was going on in the body, and that the liver was the chief seat of this hæmolysis. But when the pigments found in the urine came

to be analysed and traced to their origin, fresh difficulties arose. It was then seen that the dark colour of the urine was not due to the presence of iron but to *pigments* which were free of this metal. The colouring matter of urine in health was shown to be urobilin, which M'Munn believes is produced by the action of nascent hydrogen on hæmatin in the tissues, and not, as is more commonly supposed, derived from the reduction of bile pigments in the intestines. However, the urine in pernicious anæmia owes its deeper colour, according to M'Munn, to pathological urobilin which is of a darker colour than the normal variety, and this pigment he considers to be derived from stercobilin in the following manner. Bilirubin and biliverdin are formed in the liver from effete hæmoglobin, and pass on as constituents of the bile into the intestines. The hæmoglobin and histohæmatin of the meat taken as food also find their way to the intestines, and they, along with the bilirubin and biliverdin, come under the influence of the putrefactive ferments of the intestinal canal, with the result that stercobilin is formed from them, and, probably at the same time, ptomaïns are also formed by the action of these putrefactive ferments on the proteids. Part, then, of the stercobilin may pass on with the fæces, but part is also taken up by the portal capillaries of the intestines, and after undergoing reduction changes, is finally excreted as pathological urobilin. The ptomaïns are probably also absorbed at the same time as the stercobilin, and being present in the blood, are excreted by the kidneys, and their presence has been demonstrated in the urine.

Now this abnormal urinary pigment together with the ptomaïns, would accordingly point to an excessive putrefaction in the intestines, and that such is the case Hunter endeavoured to prove in a different way. He turned his attention to the excretion of sulphates. In health the

sulphates taken with food appear in the urine as inorganic sulphates of sodium and potassium, but during the pancreatic digestion of proteids, if this be prolonged, decomposition sets in owing to the presence of organised ferments, and the aromatic substances, indol, phenol, and skatol are formed. The skatol mainly passes on with the fæces and is the chief cause of their fæcal odour, but the indol and phenol unite with the sulphur set free from the proteids, and, combining also with potassium, they form potassium indoxyl sulphate (the so-called indican of the urine) and potassium phenyl sulphate, and these are excreted in the urine as aromatic sulphates. Hence, in health there are two forms of sulphates passed in the urine—inorganic and aromatic. Now the total daily excretion of all the sulphates when determined by the quantity of sulphuric acid passed, amounts to some 44 grains in health, 4 grains being aromatic, and 40 grains being inorganic compounds, or a proportion of 1 aromatic to 10 inorganic. But if putrefaction in the intestines exceeds the normal, the aromatic principles derived from indol and phenol will be increased in the urine but not the inorganic, which, indeed, will be lessened owing to the diminished consumption of food. In pernicious anæmia Hunter found this variation to be the case. While the entire sulphates were diminished, he found on one occasion that the relation, instead of being 1 to 10, was 1 of aromatic to 3 of inorganic; and as further proof of this, Dr. Lapper has shown that in the case of this patient of mine the aromatic sulphates even exceeded the inorganic in amount. This, at all events, proved that an excessive putrefaction was going on in the intestines, but the slight difference in the relation of these principles when taken as an index of the amount of putrefaction, did not satisfy Hunter. He did not consider that the amount of putrefaction present would represent enough putrefactive products to account for the

active destruction of blood which the excess of iron and pigment found in the urine represented. Accordingly he turned his attention to a search for ptomaïns in the urine, and he succeeded in demonstrating not only the presence of putrescin and cadaverin, which are the normal products of putrefying meat and which are not poisonous, but in addition to these he discovered the presence of an unknown ptomaïn, which he considers may be of a poisonous nature, and from this he concluded that in addition to the ordinary ferments of putrefaction in the intestines, there are also *special* micro-organisms present in this disease, which by their action produce ptomaïns of a poisonous nature, and that these in their turn act indirectly as destructive agents on the blood. I have already stated that he felt assured this active destruction of blood took place in the liver on account of the abnormal amount of iron which it contained after death, but on this point he subsequently corrected himself by very patient experiments.

He first proved that in health the daily destruction of blood is accomplished by the activity of the white corpuscles, but more especially by the activity of the lymphoid cells of the spleen, and to a less degree by the activity of the lymphoid tissue which surrounds the capillaries in the gastro-intestinal mucous membrane. He then distinguished between a direct and an indirect destruction of corpuscles; by injecting pyrogallic acid into the blood the cells were directly injured and gave up their hæmoglobin which appeared immediately in the urine as hæmoglobinuria. This direct action was not present in pernicious anæmia, but by the injection of toluylene-diamine in animals, he was able to bring about a condition similar to what is found in this disease, and the effects of this drug were of an *indirect* nature, increasing, as he supposed, the normal activity of the lymphoid cells of the spleen and gastro-intestina

mucosa—in other words, that an exaggeration of the normal process of blood destruction had taken place under the influence of toluylene-diamine. In such an indirect way, also, does he consider the poisonous ptomaïns to act in pernicious anæmia, so that this disease would be of a toxæmic character, and he now regards the function performed by the liver to be of a merely excretory nature; and by means of it and of the kidneys the effete hæmoglobin is partly stored up in their cells in the form of iron, and partly eliminated as iron and pigment in the urine. In order to give a fuller picture of Hunter's teaching I should add that he considers the presence of worms, catarrh, ulceration, &c., in the intestines as predisposing elements to the favourable growth of the special micro-organisms to which the poisonous ptomaïns owe their origin. And he considers that these toxic ptomaïns are absorbed in an irregular manner, and that when an excessive absorption takes place symptoms of toxæmia appear, accompanied by evidences of an increased destruction of blood. The evidences of toxic poisoning are those of rigors, sweating, high temperature, prostration, drowsiness, and even delirium and coma. The evidences of blood destruction are the deeper tint of skin, the darker colour of the urine, and a diminution in the number of blood corpuscles. In order to prove whether these toxic symptoms were of common occurrence, Dr. Hale White has examined the records of 30 cases which were treated in Guy's Hospital, and although in some of these delirium and coma preceded death, in only one instance was there a record of sudden onset of fever, with rigors, sweating, and drowsiness, so that Dr. White is of opinion that, on the whole, the evidence of toxæmia is slight. And with regard to the colour of the urine, Dr. Stephen Mackenzie and Dr. Hale White have each concluded that, although the urine is frequently high coloured, in many cases it is not so.

Having explained the views of Pepper, Purser, and Hunter as to the nature of this disease, I shall now relate the views which others have expressed.

Addison and the early writers on the subject believed fatty degeneration of the heart to be the cause of the malady, and this was rather an effect than a cause.

Fenwick, from finding an atrophied condition of the gastric glands, based on that a causation theory, but intestinal lesions have been so seldom found that much value cannot be attached to them.

Pye-Smith, in 1882, says it depends on a too rapid and extensive destruction of the red blood corpuscles. Delépine and Mott would look on it as a disturbance of one of the normal functions of the liver—a function which may be compared to its glycogenic function—and a disturbance of which produces increased hæmolysis, just as a disturbance of the glycogenic function produces glycosuria. Mott further suggests that this perverted action on the part of the liver may be due to the absorption of some substance from the alimentary canal. Peptone, for instance, if not changed when absorbed, might give rise to increased hæmolysis, or chemical products of putrefaction might cause it. However, with the marrow changes in his mind, he finally sums up by expressing his conclusions as follow: that an excessive hæmolytic process of a progressive and remittent character occurs for no proven or ascertainable reason, leading to an attempt on the part of the blood-forming tissues to repair this excessive waste, and often eventually determining a reversion to the embryonic type of blood-formation in the marrow and spleen.

Hunter, whose views are more recent, has shown that the hæmolysis does not take place in the liver, but in the spleen and gastro-intestinal mucous membrane.

Before speaking of treatment I should like to point out

that, in favour of my diagnosis in the present case, there are—the very grave anæmia, without evident cause, the changes in the red corpuscles of the blood, the improvements and relapses, extending over a period of four years, the excessive breathlessness and weakness, without pulmonary complication or dropsy, and with a large amount of subcutaneous fat, the slight exacerbations of pyrexia and cardiac murmurs, loudest over the pulmonary area, and of varying intensity; while, as opposed to this diagnosis, there are—the absence of retinal hæmorrhages (which, it is true, are not universally present in pernicious anæmia), the absence of iron and urobilin in the urine, and the presence of cardiac murmurs, which might be taken to represent valvular disease of the heart. Now, with regard to the urine, although iron is generally admitted to be present, it is not so with urobilin. In Byrom Bramwell's eight cases the urine was either very pale or normal, and the search for urobilin has been limited to recent cases. In this case the urine was darker a year ago, and at the time of analysis arsenic had been administered for nearly two months. In considering the question of a cardiac lesion, even if the murmur was granted to be of valvular origin, the fatty degeneration and dilatation of the heart arising from the anæmia would account for it; and although I am fully aware of the extreme anæmia which often accompanies cardiac lesions in children, I do not think the extreme degree which is present in this case is ever found in adults—at all events without other signs to confirm it.

I now pass on to the treatment of this disease. Dr. Stephen Mackenzie, in his Lettsomian Lectures on Anæmia delivered in 1891, says: "The position to-day is but little altered since Addison said of it, that, with scarcely a single exception, it was followed after a variable period by the same fatal result."

Undoubtedly many cases of recovery have been recorded,

but it is too often only of a temporary nature, and it would be interesting to hear the experience of those who have followed up cases of apparent recovery during subsequent years.

The general treatment includes keeping the patient in the open air and sunshine when possible, rest, massage, and a farinaceous and milk diet. With regard to medicinal treatment, arsenic has been credited with numerous cures, but many cases remain wholly unbenefited by its use.

Dr. Byrom Bramwell and Dr. Finny, who were the first to give this drug a trial, met with more success than has since been observed from its administration. Although I have been using it for two months in the present instance, the results are disappointing, but still there is no doubt the corpuscles have become more natural in shape.

Hunter recommended beta-naphthol on account of its strong antiseptic properties. In some cases it seemed to do good. I intend to use it as soon as I am satisfied that the arsenic has had a fair trial, and from the amount of putrefaction which was shown to be present from the indican and sulphates of the urine, I should think antiseptics would prove beneficial. Dr. Duffey informs me he has used thiocamf as an antiseptic with some success in a case which is under his care at the present time. Quinine has been given during the pyrexial attacks. Phosphorus and mercury have also been used. Oxygen inhalations have been said to improve the patient's condition. Transfusion of blood has been repeatedly tried, and with benefit, perhaps, in a few cases, but oftener it seems to have hastened the end.

Dr. Brackenridge, of Edinburgh, has recorded, in the *British Medical Journal* of July, 1892, the result of this method of treatment in some cases where arsenic had been a failure. The result encouraged him to give future cases a trial of it. He believes the cause of the disease to be a

faulty blood genesis, and he hopes by transfusion to give the blood-forming organs an impetus which would bring them within the curative effect of arsenic.

Dr. Graves wished to know whether the colour of the patient's skin was peculiar. In all the cases he had seen the skin had a faint lemon colour.

Dr. Little said that he had noticed that this disease occasionally affects members of the same family. Many years ago he attended a lady suffering from it, and who died; four or five years afterwards her sister died from the same disease, and in a few more years their brother died of it. They were all about the same age at the time of their deaths. He remembered seeing a case in the Adelaide Hospital in which the patient had severe pyrexia when he died. In the early stages of the disease the diagnosis lay between cancer of the stomach and pernicious anæmia, and it was only after a lapse of time that a positive diagnosis could be given.

Dr. Craig, in reply, stated that when the patient came to him his skin had a very yellow tint.

MALIGNANT ENDOCARDITIS.

By JOHN JOSEPH BURGESS, F.R.C.S., L.R.C.P.

[Read in the Section of Medicine, December 15, 1893.]

THAT the subject of malignant endocarditis has occupied largely the attention of our profession since its first recognition by Wilkes in 1852 is attested by the number of papers written on this interesting and very fatal malady. In these we find respective groups of cases so divergent in symptoms that were it not for the finding of the invariable pathological changes in the valves of the heart after death, one would be disposed to regard them as dissimilar forms of disease.

This diversity has led to the division of malignant endocarditis adopted by Osler, of Philadelphia, in the Gulstonian Lectures of 1885, into four varieties—typhoid, pyæmic, cerebral, and cardiac; and as regards the physical signs into—

1. Cases which affected the heart primarily.

2. Cases which affected the heart in the course of other diseases, such as pneumonia and acute rheumatism.

3. Those which are septic in origin, and in which the cardiac signs are preceded by symptoms of septic poisoning.

This subject has been twice before the Academy in two papers—one by Dr. Purser, on a case of the cerebral type of the disease, the other by Dr. Walter Smith, on the rarer form attacking the right side of the heart. In both the evidence of a most carefully made necropsy gave them the greatest interest in a pathological sense, which advantage I regret I was unable, for certain reasons, to obtain

for mine. I am, therefore, limited to bring forward this case in its clinical aspect, and to endeavour to excuse myself for the absence of fuller and more satisfactory data by presenting to you in detail the symptoms, and thereby giving you an opportunity of judging the difficulties of the diagnosis.

CASE.—Late in the evening of the 15th of August, 1893, I was called on to see a lady, Mrs. R., who had taken suddenly ill. She had come to town with her husband, a solicitor from the south of Ireland, to spend a few weeks in Dublin and remain for the Horse Show. She was a tall, moderately thin woman, of emotional temperament, florid and healthy looking, aged thirty, and six months pregnant; had four living children, no miscarriages. She informed me that except for her pregnancies she had never been a day unwell. On this day, after taking a warm bath, she got a chill, which lasted for some time, with shivering, immediately followed by a prostrating headache, with pains all over her body, and a general feeling of sickness. She was very restless; skin hot and dry; face flushed; temperature, 103·4°; pulse, 128; no cough or sore throat. The only physical sign detectable was a blowing murmur at the apex of the heart, perceptible in the axilla and at the left scapular angle. Except for some slight pains after wettings, which gave her no inconvenience, she had never suffered from rheumatism, nor had her breathing been affected by exertion.

The next morning she was apparently quite well. Her temperature was 97°, pulse 78, but the murmur was still audible and unchanged; all pains gone. She was quite cheerful, and decided to return to her home on the 18th, as she said she had had enough of Dublin.

In response to a telegram on the morning of the 18th I visited her. She told me she was afraid she must have got a relapse. She had been quite well and out the day before, but during the night her husband had taken ill, and getting out of bed several times when the window was open (the weather being then very warm) she had another shivering fit in the early morning, which was succeeded by stiffness in her neck, pains between the shoulders and at the back of the head. Her temperature was 101°, pulse 120; murmur unaltered in character; skin dry. There was considerable enlargement of a gland in the parotid region, with great

tenderness, which evidently caused the stiffness of the neck; no sore throat. In reference to this glandular swelling she stated it had come on before during her pregnancies, and gave trouble for a few days.

On the next day, the condition being otherwise unaltered, the pains had extended to the lower extremity; knees drawn up and flexed to nearly a right angle. There was no redness or inflammation about any of the articulations; no sign of roseola or other rash. The pains, as she expressed it, extended in paroxysms from the inside of each knee to the pit of her stomach. They were so violently increased by movement that she screamed; yet when her attention was otherwise directed she could be lifted up without any complaint. A peculiar and continuous symptom unassociated with these was a violent, lancinating pain over the symphysis pubis. The knee reflexes were slightly exaggerated; no tender points on percussion could be found over spine; considerable hyperæsthesia about all the painful regions, but complete tolerance of deep pressure; and there was no hardness along the course of the veins. The abdomen was neither tympanitic nor painful, and the skin was everywhere free from redness and dry. Her mind was perfectly clear; tongue slightly furred in centre; anorexia and constipation; urine non-albuminous.

On the 22nd the symptoms, with the exception of the inflamed gland in the neck, which had improved under treatment, being the same, premature labour set in, and she was delivered of a living six months' fœtus, which, however, survived its birth only 20 hours.

For the next few days there was no change. The confinement appeared to exercise no influence over the course of the illness; the lochia were normal; the uterine symptoms were similar to an ordinary uncomplicated labour case; the pains, temperature, and pulse did not vary—the former were generally better in the morning but became troublesome at night, so that sleep was impossible without narcotics.

On the 25th her breasts were hard and painful; the temperature rose to 103°. Dr. Nixon saw her and attended with me from this day.

The problem before us was—A young, healthy married woman, of hysterical temperament, had been ill for ten days with pyrexia and pains without any inflammatory symptoms, except a murmur with the first sound of the heart. Three days ago, on the seventh day of her illness, premature confinement at the sixth month had

taken place. We agreed that the present conditions were somewhat aggravated by the milk in the breasts, which caused the rise in the temperature, and that the pains were of a neural character, made worse by the hysterical tendency; the heart murmur Dr. Nixon did not think of recent origin. The two difficult points to account for were the continuous pyrexia and the pain at the symphysis, for which we could discover no cause.

For the three following days the temperature continued at its new level, the other symptoms being unaltered, except for a development in the occurrence of dysuria—she had to be lifted up in bed into a sitting posture before the urine would come away. A vaginal examination was made, which disclosed no pelvic cellulitis or other cause to account for this new symptom—the lochia were plentiful and not fœtid, and the uterus appeared shrunk to its normal limits.

On the succeeding day diarrhœa of a typhoid character came on, there being five or six motions during the night. All this time the pain was the same in the lower extremities and symphysis pubis; the upper pain, that is, in the back of neck and between the shoulders, had improved; the swelled gland had undergone resolution; there was no tenderness or enlargement of the spleen; the urine contained no albumen, but the dysuria continued; the temperature remained high, and the tongue had become browner and drier, with no signs of a rash on skin. Her intellect was perfectly clear, and except for occasional fits of crying she was not depressed.

At this time, despite the absence of many pathognomonic symptoms, I considered the case looked very like enteric fever. Then there occurred a sudden change: the diarrhœa ceased, the pulse and temperature fell to normal, the pains disappeared, the tongue cleaned and became moist, her spirits improved, and except for the evidence of damaged valves she seemed to be progressing towards convalescence. This occurred on the evening of the 30th August and continued for the next day and night—in all nearly thirty-six hours.

On 1st September I found her very agitated. Her husband seeing her so much better had left for home to attend some urgent business. This appeared to affect her very much—she had been crying all the morning, and felt feverish and sick. Her temperature was 103°; pulse, 128. The pains, which had gone, leaving some stiffness, fortunately did not return, but she had complete

inability to pass water, and a catheter had to be used. Dr. Nixon saw her with me in the afternoon. The fever continued, and she appeared more depressed than formerly.

The next day (2nd September) I found her much more cheerful, but with no abatement in the fever. In the afternoon she had an attack of convulsions of a general character. When we visited her later on there was incomplete aphasia, which was gradually passing away, as the nurse informed us she was unable to speak for half an hour after the convulsive seizure. There was partial paralysis of the right arm and right side of face—so that the case appeared to belong to the type of brachio-facial monoplegia—the heart was acting tumultuously, and the murmur had changed and become louder and rasping. She was able to put out her tongue, which deviated to the right.

At 10 p.m. (six hours later) she was still conscious, but had developed complete aphasia, right hemiplegia, paralysis of right side of face, and paralysis of the right third nerve—presenting right ptosis, dilated pupil and right external strabismus; temperature, 105°; pulse, 140.

By the wish of her husband Dr. W. Smith and Dr. Gordon were called in.

On the 3rd September she was seen by Dr. Gordon in consultation with Dr. Nixon and myself; she was then sinking into coma, which gradually deepened during the night, with dilated pupils; Cheyne-Stokes' respiration and relaxation of the sphincters, and she died at 2 p.m. on the 4th September, twenty days from the outset of the illness.

The case is remarkable for the following four things:—

1. The heart murmur.
2. The nervous phenomena.
3. The peculiar temperature.
4. Its obscurity until about forty-six hours before death.

In some of the recorded clinical cases of malignant endocarditis we find there has been a period of illness before the murmur was heard at the cardiac valves; in others the murmur was heard from the first, but in those there was previous history of its presence as a sequel of rheumatism.

Now, in this case it will be remembered I saw the lady six hours after she had taken ill, and at that time there was a distinct murmur at the cardiac apex, substitutive in character, and unaltered by the fall of the pulse on the following day. Her previous history of rheumatism amounted to nothing, the pains were of too fleeting a character. I have seen the mild varieties of rheumatism, extending from one part of the body to the other, frequently set up severe endocarditis, but here the pains were only such as anyone feels after being chilled in damp clothes, which lasts for a few hours or perhaps a night. I consider it most improbable that heart disease could be set up without the rheumatic symptoms giving at least some inconvenience by which they would be remembered. Was it possible to believe that the distinct mitral murmur was developed in a few hours from a state of robust health without rheumatic or pyæmic cause? The conclusion I came to at the time was that the heart affection was all depending, if not on rheumatism, on some cause associated with a former pregnancy. But subsequently, in a reply to a letter from me, her doctor wrote to say he had examined her heart six weeks before, and was positive there was no murmur present, and substantiated what she had told me about her always enjoying good health. Had there been a murmur at the time he must have recognised it, as it was distinct enough when I heard it for the most careless examiner to detect. The murmur was distinctly mitral, soft in character, until the occurrence of embolic seizure, when it became rasping, and was audible in the usual situations—at apex, axilla, and angle of scapula. Once I heard another murmur at the base, but I was unable to detect it afterwards; her heart was apparently not enlarged, as the apex beat was inside the nipple line. What really occurred, in all probability, was that there existed

old-standing disease of the mitral valve so limited in amount or situation, and set up by some other cause than rheumatism, that it presented no signs detectable in her ordinary health, but formed the nidus for the malignant form.

The nervous symptoms were the most pronounced feature in this case. So uncommon are they in this form that I can only find a single example, among the many recorded cases, of any similar. The pain was intense; the legs were drawn up on the abdomen to try to get some relief from the violent attack of lightning pain; sleep was impossible without opium. The pain at the symphysis was evidently neuralgic, but it was very difficult to account for, as it was not one of the ordinary painful zones of Reicher, found in hysteria; besides, it was not the seat of any nervous plexus which might account for the severity of this symptom.

As I mentioned before, there was no deep tenderness on pressure over the bone, nor at the symphysis articulation; and this symptom was not of an intermittent character, but it was present throughout—not made worse by the paroxysms attacking the branches of the anterior crural nerve. I attach no importance to the pains behind the shoulders, as I believe they were set up by the inflamed parotid gland. The later symptoms pointed to embolism in the left side, evidently affecting the mid-cerebral artery and cutting off the supply of left internal capsule, anterior central convolution, and para-central lobe; the paralysis of the third nerve, causing ptosis, external strabismus, and dilated pupil on the right, indicated a second lesion on the opposite side.

The regular character of the fever differed from the intermittent or remittent type generally found in this disease. First of all you will notice the sudden fall, on

the 16th, from 103·4° to 97°. This remarkable depression did not again occur during the course of the illness. The temperature was found on the 18th to be 101°—this level it maintained for seven days without any distinct remission. I may state here that this temperature is exact—not influenced by any drug—it was taken by two thermometers several times in the twenty-four hours, and it never exhibited any variation from the chart [shown]. A remarkable thing was that ten grains of antipyrin would reduce it one degree for half an hour. After the confinement, on 22nd, except for the milk fever, the curve underwent no alteration; it remained two degrees higher with the same uniformity until the breasts began to resolve, when it sank to its previous level, and gradually dropped to normal; the fall, which continued from the 30th August to the 1st September, was very singular, and a much longer intermission than is recorded in any case I could find.

The next rise, on the 1st, is due to the recrudescence of the disease, and the hyperpyrexia to embolic infarction of the brain. The inflamed parotid gland was of interest in this respect; this I find is mentioned as a complication in at least one of the cases.

The point may now be raised whether the case was one of malignant endocarditis from the first, or secondary to sepsis from the premature labour. I believe the disease was primary for the following reasons:—

1. Since the first feelings of malaise the symptoms had been the same until the embolism supervened, the dysuria being the sole exception as a symptom, which began after the confinement.

2. The temperature was unaltered, save for the slight rise caused by the breast trouble, after which it again sunk.

3. The lochial discharge was at no time fœtid or scanty.

4. There were no rigors.

5. Even taking the latter hypothesis, how would it then be possible to account for the previous pyrexia and nervous symptoms?

The chief point in this case is the diagnosis. Malignant endocarditis may be confounded with pyæmia, ague, tuberculosis, and enteric fever. As to the first three there was no difficulty; there were no rigors, except at the beginning; there was no cough or sweating. The absence of this last was peculiar or different from most of the recorded cases; it more resembled enteric than any other disease—the aspect, with malar blush, somewhat dilated pupils, clear intellect, and colour of the stools, was like a mild seizure of the fever. Opposed to this were the prominent pains, the absence of meteorism, splenic enlargement, and iliac tenderness, with the peculiarity of the temperature, which was of a continuous type, and the non-appearance of rash. Except for the above resemblance to enteric it did not correspond to any of the varieties of the disease, and belonged to the first form in the second division, where the heart is primarily affected. This class is generally supposed to represent a condition where the malignant form supervenes on old-standing endocarditis. During the whole course there was no symptom of embolism of the spleen or kidney; no rigor or delirium. The nervous phenomena pointed to spinal trouble, but the presence of the fever and the absence of more pronounced symptoms of myelitis or inflammation of the membranes made me discard this source. The embolism occurred forty-six hours before death, and helped to substantiate the diagnosis already entertained of malignant endocarditis. I have made no reference to the treatment—all through it was symptomatic—and I will conclude with the hope that as pathology has made such great

strides since the days when Wilkes first wrote on ulcerative endocarditis, so medical science will discover some means, if not of curing, at least of diminishing the risks of this unhappily ever fatal disease.

Dr. Tweedy remarked that, as Dr. Burgess stated that he and Dr. Nixon at first considered the case one of hysteria, he wished to mention a case which he saw many years ago, and which he at first imagined to be one of hysteria, and which afterwards proved to be one of meningitis, as illustrating the difficulty that frequently existed in making an early diagnosis with accuracy.

Dr. J. W. Moore said that he had seen a case of a young married woman who was suddenly seized with febrile symptoms and rheumatoid pains. There was a systolic murmur; the temperature was high and variable, and there was extreme prostration. He and Dr. O'Carroll at first considered it to be a case of malignant endocarditis, but the patient subsequently got quite well, although for a fortnight her life appeared to be hanging in the balance.

A CASE OF ASSOCIATED PARALYSIS OF THE RIGHT PORTIO DURA AND PNEUMOGASTRIC NERVES.

By J. W. MOORE, B.A., M.D., M.Ch. Univ. Dubl., F.R.C.P.;
Physician to the Meath Hospital;
a Professor of Practice of Medicine in the Royal College of Surgeons in Ireland.

[Read in the Section of Medicine, January 19, 1894.]

Late in the afternoon of Monday, November 6, 1893, I received the following note from a lady living in one of the suburban districts of Dublin:—"Dear Dr. Moore, will you kindly come out this afternoon to see a young lady who is staying with us. She seems suffering from a bilious or gastric attack, and is very poorly. If unable to come, will you kindly send word by bearer. Yours sincerely, C. D."

I obeyed this message without delay, and on my arrival at the house, about 5 45 p.m., found the patient as described in my friend's note. She was a girl of nearly thirteen years of age, well-grown, and apparently of sound constitution. At the time of my visit she was hot, flushed, and restless. Her pulse was 124, and the temperature in the axilla was 103·4°. Vomiting occurred from time to time. Signs and symptoms of palsy of the right portio dura nerve were markedly present. The right side of the face was motionless and without expression. The brow could not be wrinkled on that side, nor had frowning any effect. She could not close the right eye, and when she made the attempt, the eyeball turned upwards and outwards, but the lid remained motionless. Attempts to smile led to grotesque displacement of the mouth towards the left side; and articulation was much interfered with. The tongue, when protruded, seemed to be pushed out sideways owing to the deformity about the mouth. The right half of the

palate was flaccid and motionless, and already there was extreme dysphagia. Hearing was unimpaired.

On inquiry I ascertained that Constance C.—for this is my patient's name—had enjoyed good health up to the early autumn of 1893, when she had a severe cold, followed by nasal catarrh, to which she appears to have been always more or less subject. She menstruated for the first time a year ago, at the age of only twelve years. To shake off the effects of the cold, her mother took her in October for a trip to Cork and Dublin from her home in the north-west of Ireland. Up to the evening of Friday, November 3, the girl seemed to be in excellent health and high spirits. During the night of the day named, however, she became acutely ill, with giddiness, headache, and finally severe vomiting and shivering, followed by high fever. The headache was referred chiefly to the back of the head, but it was also frontal. These symptoms persisted through Saturday and Sunday, but were supposed to arise from a "bilious attack." As the distressing vomiting continued on Monday, I was at last sent for and visited the patient in the evening as already stated.

A small blister was applied behind the right ear. Three grains of calomel were given at once, and it was ordered that a tablespoonful by measure of the following draught should be exhibited every second hour, as a febrifuge and sedative :—

℞. Phenazoni, gr. 20;
Tincturæ gelsemii, min. xx;
Aquæ chloroformi, ad ℥ij.

M. ft. haustus.

At my next visit, early in the morning of November 7, the pulse had fallen to 96, and the temperature to 99·1°. The facial palsy was now complete. On examining the interior of the mouth, the right side of the palate was red and motionless, and I saw large quantities of foul-smelling secretion (mucus and pus) flowing or trickling down from the posterior nasal tract on the right side. There was also absolute inability to swallow. Any attempt to get even water down resulted in painful choking, spasmodic cough, and finally regurgitation through the nares and mouth. The salivary glands seemed to be stimulated by the effort at swallowing, for the mouth quickly filled with a quantity of ropy saliva. The patient was quite conscious, and there was no heart lesion.

I came to the conclusion that the paralysis was probably due

to a neuritis of the portio dura on the right side, depending on a suppurative rhinitis. The sudden supervention of paralytic dysphagia was less easy to explain. I searched most carefully for the smallest trace of diphtheritic membrane on the back parts of the mouth, but in vain. Glycerine of borax was ordered as a mouth-wash—a teaspoonful to be mixed with a claret-glassful of water. It was also ordered that the nostrils should be washed out with an ounce of the following lotion:—

℞. Potassii chloratis, gr. 60;
Sodii chloridi, gr. 90;
Glycerini, ℥ss.;
Aquæ, ad ℥ x.

M. ft. lotio.

As the bowels had not acted after the dose of calomel given the previous evening, I prescribed an enema of turpentine and asafœtida. It should be observed that the patient, being quite unable to swallow, had been fed by the rectum every third hour during the previous night, the phenazone draught being added in tablespoonful doses to each nutrient enema, as well as a sufficient quantity of zymin peptonising powder. Four hours of sleep had been obtained through the night, but the patient became very restless towards morning. The day passed over quietly, but a wretched night followed, with only one and a half hours of sleep, and even that in snatches; speaking also became very indistinct; and both pulse and temperature rose towards morning—the former to 114 per minute, the latter to 100·8° at 8 30 a.m.

As the case appeared most grave, I urged the necessity for further advice, and Dr. James Little accordingly saw the patient, in consultation with me, immediately afterwards. I should also mention that two nurses from the City of Dublin Nursing Institution were at this time in charge of the patient, and to them I owe a very careful record of the daily dieting, therapeusis, and general management and condition of the case.

Dr. Little made an exhaustive examination, both on this day and again on November 15, and has been good enough to embody his impressions in the following notes:—

"Nov. 3.—Occipital headache and giddiness.

"Nov. 4 and 5.—Much vomiting, headache, giddiness, and feverishness.

"Nov. 6.—Still vomiting, articulation affected, right facial palsy and inability to swallow.

"Nov. 7.—Pus flowing from the right posterior naris—very offensive.

"Nov. 15.—Temporary deafness in right ear, followed by an increased flow of offensive pus."

He adds:—"Since then complete right facial palsy; patient speaks with a nasal twang; any attempt to swallow brings on choking; an offensive smell from the mouth, and purulent matter coming from the posterior nares on the right side."

Dr. Little suggested that, with the view of securing intestinal and general antisepsis, 15 grains of benzoate of sodium should be administered in the nutritive enemata every third hour. He also recommended that 60 grains of boric acid should be dissolved in a pint and a half of tepid water, and that this solution should be allowed to siphon through the nasal passages every three or four hours, a Sieveking nasal douche being used for the purpose. A tolerably quiet night ensued, the patient sleeping on and off for six hours, but showing a good deal of nervous prostration, and passing under her twice.

On the morning of November 9, the pulse-rate was 96; respirations, 36; temperature, 100·4°. Irritability of the bladder now began to give trouble, urine being passed frequently, but only in extremely small quantities—one to three drachms at a time. It was turbid with urates, but cleared on subsidence; was strongly acid, contained much albumen, but was free from sugar. Its density was 103° C. The moment strong nitric acid was added to it, nitrate of urea crystallised out. Troublesome thirst was on this day and afterwards relieved by enemata of cool water. At 12 noon she tried to swallow a little water by the mouth, but it "went very much against her breath," and in part returned through the nostrils. An attempt to swallow a grape was quite unsuccessful.

The skin near the anus now threatened to become sore; but the tendency was controlled by the use of an antiseptic dusting powder, composed of an ounce of oxide of zinc, the same quantity of lycopodium powder, and half a drachm of pure liquefied carbolic acid. The quantity of urine passed in twenty-four hours at this time varied between 9 and 15 fl. ozs., the average quantity being 12 fl. ozs. On November 13 its specific gravity was 1040, it was highly albuminous, and nitrate of urea crystallised out with extraordinary rapidity—in fact, instantly.

The mouth was at this time clogged with thick, ropy saliva,

which was got away by filling the mouth with glycerised water, and allowing the fluid to pour out between the opened lips.

On Wednesday morning, November 15, Miss C. complained for the first time of transitory deafness in the right ear. This was succeeded by an increased flow of fœtid pus, and the fœtor from the mouth and breath was very disagreeable. The deafness appeared to be due to temporary blocking of the entrance to the Eustachian tube by pus flowing down from the nasal passages.

Dr. Little saw the patient, in consultation, for the second time this day. As the lower bowel had become very irritable, and as the discharges from the bowels were horribly offensive, it was agreed, on his advice, to add 10 minims of tincture of opium to the nutrient enemata every third hour. Salt also was added to each injection. The daily dose of laudanum varied for a few days from 50 to 70 minims.

On Thursday, November 16, a decided change for the worse seemed to be impending. The girl felt weak and queer, her head was hot at one time, cold at another, she complained of soreness over the heart and then of abdominal pain, as she lay on her right side. Her feet and hands were icy cold, and she felt sick. The deafness returned for a short time, affecting (as before) only the right ear. She complained of a lump in her throat. On the evening of this day the axillary temperature rose to 102·8°, the pulse was small, thready, and rapid (110–112). She obtained relief as the night wore on, and rinsed out her mouth with freshly made tea next morning. The attack appeared to be septicæmic in origin.

It was now imperative that some further means should be taken to disinfect and deodorise the contents of the lower bowel. Accordingly, I ordered a two-minim capsule of thiocamf to be pushed into the bowel several times daily—some time before the administration of an enema. This measure was fairly successful, the capsules were nearly always retained, and less gas of an offensive kind was formed and escaped from the bowel. Notwithstanding this, the discharges were very unhealthy, and during the next two days the bowel became less and less tolerant of the nutrient enemata, although their bulk was reduced one-half. They were still given at intervals of three hours, as the girl was manifestly wasting and failing in strength. Indeed, so critical was her condition on Saturday, November 18, that I felt it absolutely necessary to begin feeding her with the œsophageal tube. Accord-

ingly, at 6, 8, and 9 p.m. small quantities (10 fluid ounces in all) of warm peptonised milk were poured into the stomach through the tube. The stomach was then allowed to rest through the whole night, as the presence of food in it was such a novelty—practically nothing had been swallowed from Monday, November 6, to Saturday, November 18. A fairly quiet night followed.

Between 10 and 11 a.m. of Sunday, November 19, another meal of 5 ozs. of peptonised milk was given. At 3 p.m. she had 9 ozs. of beef-tea by the tube, and at 8 p.m. 10 ozs. of peptonised milk.

From this time onward Miss C. was fed like a typhoid fever patient—always, of course, through the tube. She began to put up flesh and to gain strength. The kidneys also acted more freely, and the albuminuria gradually decreased and finally ceased. On November 24, the specific gravity of the urine was 1033, and the secretion was only slightly albuminous. Although there was continued complete inability to swallow, great pleasure was derived from rinsing out the mouth every morning with a cup of freshly made tea, with milk in it; also from gargling the mouth with glycerised water or with plain water from time to time. On and after November 18, also a linctus of glycerine of carbolic acid (ʒss.), and glycerine of borax (ʒiss.) was used occasionally for a mouth and nose spray—one teaspoonful being mixed with four ounces of tepid water.

On November 24, Dr. Little saw her for the third time in consultation. There was some improvement, so far as the paralysis was concerned. Thus, the right side of the forehead could be to some extent thrown into wrinkles, and the right eye could be almost closed. It had been the seat of a threatening conjunctivitis—principally from exposure. The right palatal arch now moved freely, and the faucial reflexes were restored. The heart, however, was quick and weak, and temperature remained subfebrile, rising sometimes nearly to 100° F. We ordered the following mixture:—

℞. Liquoris strychninæ, ʒj;
Acidi hydrochlorici dil., ʒiij;
Liquoris hydrargyri perchloridi, ʒvj;
Glycerini, ʒvj.

M. ft. mist. Signa: "A teaspoonful by measure twice daily as directed" (that is, with food by the œsophageal tube). "Antiseptic pastilles" were now used in the nose and mouth washes.

As indicating the condition of general nervous depression which was present, I may mention that incontinence of urine was a common, incontinence of fæces an occasional, occurrence at night. The daily output of urine at this period varied from 16 to 24 fluid ounces.

The next great step was taken on November 29, when she was allowed to sit up by the fire for twenty minutes. She felt very well and enjoyed the change immensely. On the afternoon of this same day she sat up again for forty minutes. On the following day she was carried downstairs for an hour. The incontinence of urine ceased from this time, and the quantity increased to 24, and finally to about 30 ounces. Miss C. now began to move about a little, and remained up for several hours each day. On December 6, she changed her abode from Morehampton-road to Waterloo-road, and bore the short journey right well. She now went out for a daily drive as the weather permitted. She read and was read to, and in a word began to enjoy life once more. Notwithstanding, the paralysis remained unaltered, and any attempt to swallow ended in failure and disappointment.

As the patient's parents were very anxious to go home to a distant part of the country before Christmas, it was thought well to have special advice as to the state of the nasal tract, and of the pharynx and larynx. Accordingly Dr. Richard A. Hayes joined Dr. Little and me in consultation on December 13. Dr. Hayes has been good enough to place in my hands the notes which follow:—

"On December 13, 1893, being asked by Dr. J. W. Moore to see Miss C. with him and Dr. James Little, I found the symptoms of paralysis of the right facial nerve as detailed by Dr. Moore. The velum palati, however, then showed sufficient reflex to somewhat impede the posterior rhinoscopic examination; but with the assistance of our very intelligent patient I obtained an excellent view of the parts.

"The mucous membrane of the naso-pharynx was red and swollen, as was also that of the right posterior naris, but no purulent discharge was visible. On examining the right anterior naris I found general redness and swelling, the inferior turbinate body being much enlarged.

"The left passage was normal, except that it was unusually roomy, allowing a clear view through to the pharynx.

"The swelling on the right side was at once reduced by spraying with a solution of cocaïn, and there was then plainly visible a thin stream of pus passing down over the middle turbinate, and coming from between the superior and middle turbinates.

"On examining the larynx I found distinct abductor paralysis on the right side; the larynx was otherwise normal.

"The difficulty in swallowing was probably caused by paralysis of the pharyngeal constrictors, as the patient was unable to make any attempt at swallowing.

"There appeared to be no doubt, from the history of the case given by Dr. Moore and the appearances found in the nose, that there had been suppuration in the right sphenoidal sinus, the ready escape of the pus from the cavity, by way of the pharynx, as observed, preventing the pressure symptoms usually observed when the pus is retained; and it seems evident that the paralysis of the facial, and some parts of the pneumogastric, could not have been produced directly by the inflammation in the sinus, but must have been caused by extension of the inflammation along the base of the brain to the position of exit of these nerves from the cavity of the skull. Although no considerable veins from the sphenoidal sinuses pass into the venous sinuses, there is, doubtless, a certain amount of communication; and as the inferior petrosal sinus passes backwards in such a direction as to cross the nerves involved, it seems possible that there may in this fact be found an explanation of the singular and interesting combination of symptoms occurring in this case."

At this consultation it was agreed that iodide of potassium was the drug which would best fulfil the indications for treatment at the time existing. A simple solution of the salt was ordered, and a dose, representing at first 5 grains, and then 10 grains, was given by the œsophageal tube with one of the meals three times a day. No symptoms of iodism were apparent up to the time when the patient left Dublin for the County Sligo on Friday, December 22. She travelled by the limited mail train on that day to Ballina—a distance of 166 miles—and felt so strong at the end of that long railway journey that she asked her parents to be allowed to finish the journey home—a drive by road of three hours' duration. On her arrival at 6 p.m. she felt fresh and well, having borne her long day's journey much better than could reasonably have been expected.

On January 2, 1894, her father wrote to me—"I am sure you

will be glad to hear that Connie is going on nicely. She is gradually getting stronger, but there is no change for better or worse apparently in the throat."

The electrical reactions were, unfortunately, not tested in my case. The paralysis of the facial nerve was clearly not due to a lesion *above* the facial nerve nucleus in the pons Varolii, for the orbicularis palpebrarum was completely palsied, and the conjunctival reflex was abolished. Accordingly, the "reaction of degeneration" (as Erb called it), "in which muscular irritability towards faradic currents is usually markedly impaired, perhaps even appears totally gone, but in which the galvanic irritability is not only preserved, but actually heightened for a time" (W. G. Smith)—was most probably present, more particularly as the paralysis was so persistent. The question of electrical treatment was mooted at one of the consultations, but it was decided not to adopt it. As to prognosis, the origin and nature of the attack so clearly threatened a tedious course that it seemed unnecessary to apply electrical tests in addition to the numerous measures which were being taken to keep the patient alive and promote local and general antisepsis. I have long been familiar with the excellent paper on Facial Paralysis, which our President, Dr. W. G. Smith, read before the Medical Society of the College of Physicians, on Wednesday, January 2, 1878, a paper in which the author so clearly describes the action of induced (Faradic) currents, and of interrupted voltaic currents in the varieties of this form of paralysis as to leave nothing to be desired.[a]

But, to my mind, the chief points of interest in the present case are—the probable origin of the paralysis and its distribution.

To take the latter point first: the lesion of the seventh

[a] Dublin Journ. of Med. Science. Vol. LXV., No. 74. Third Series. February, 1878. Page 125.

nerve was certainly above the geniculate ganglion, because the muscles of the soft palate (*levator palati, azygos uvulæ,* and probably the *palato-pharyngeus*) were involved. Next, the associated paralysis of the pharynx (*dysphagia paralytica*) pointed to some affection at the base of the brain, probably compression of the cranial nerves in the situation indicated in an interesting note which I have received from Dr. Francis T. Heuston—namely, in their course from the brain to the internal auditory meatus in the case of the facial nerve, and to the posterior lacerated foramen in that of the pneumogastric. That this latter nerve was implicated is fully confirmed by the results of the laryngoscopic examination made by Dr. Hayes, which showed abductor paralysis of the right side.

Dr. Heuston writes thus in reply to a query addressed to him by me to this effect—Given a case of suppuration in the right sphenoidal sinus, in what way might the corresponding facial, glosso-pharyngeal, and pneumogastric nerves become involved in inflammatory processes or suffer compression?—

"In reply to your question, I would say the most probable manner in which implication of the facial and pneumogastric nerves would occur in connection with a suppurative affection of the sphenoidal sinus is as follows:—Owing to the proximity of the sphenoidal sinus to the sella turcica and dorsum sellæ the inflammatory process would implicate the dura mater. Covering those parts an effusion separating the dura mater from the bone in the regions mentioned would probably extend towards the foramen magnum and posterior surface of the petrous portion of the temporal bone, the posterior fossa of the skull being in a more dependent position than the middle fossa. Taking such a condition as being probable, it is very easy to understand that this effusion should press on those nerves in their course from the brain to the internal auditory meatus (facial) and posterior lacerated foramen (pneumogastric) respectively, or as those nerves were leaving the skull through their respective foramina.

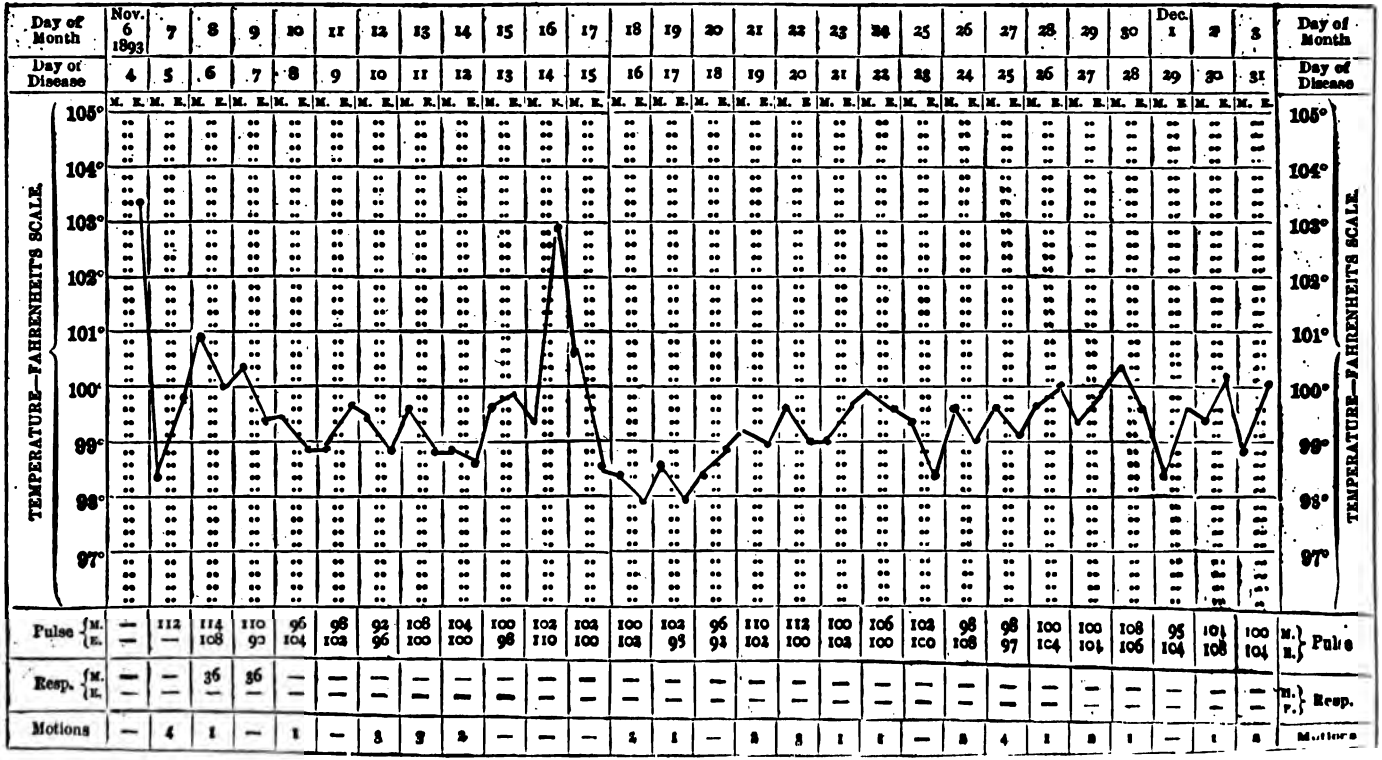
"Not having seen your case, I do not know if this explanation covers the ground, but would give it as the most correct answer, in my opinion, to your question."

When I addressed a further query to Dr. Heuston asking for an explanation of the escape of the auditory nerve from injury, when the portio dura was so seriously involved, he suggested that the pressure of inflammatory products, or of a collection of pus, might have been exercised only indirectly on the portio dura and pneumogastric nerves. In other words, that the pressure was made directly on the pons and medulla, and extended to the nerves involved at or near their points of origin, and before they came to the surface of the brain. In this way he thought it possible, on anatomical grounds, to differentiate between lesion of the facial and escape of the auditory nerve. The facial nerve proper arises from an elongated nucleus which is deeply placed in the reticular formation below the floor of the fourth ventricle. The *pars intermedia* of Wrisberg arises from the extreme upper (proximal) end of the sensory nucleus of the glosso-pharyngeal nerve (Duval). The small-celled or chief nucleus of the lateral and mesial roots of the auditory nerve is superficially placed in the floor of the fourth ventricle. The large-celled or Deiter's nucleus is placed close to the inner side of the restiform body. I give these anatomical details on the authority of Dr. H. St. John Brooks, University Anatomist in the School of Physic in Ireland, who has contributed an excellent monograph on the "Nervous System" to Mr. Henry Morris's recently published "Treatise on Human Anatomy."*

*London: J. & A. Churchill. 1893. 8vo. Pp. 1,310.

Clinical Chart of Temperature, &c.

Constance C.; Age, 13.



Dr. Parsons wished to ask what was the condition of the patient's tasting powers. Could the paralysis of the 7th be a mere coincidence? It was very odd that the 6th nerve was not affected if the patient suffered from basal meningitis, considering the frequency with which it is affected. As regards the path by which sensory impulses of taste reached the brain, physiologists and clinical physicians were not yet agreed.

Dr. R. A. Hayes considered that it was pretty evident that there was an empyema of the sphenoidal air sinus. The pus, however, found free exit and did not produce pressure symptoms. An extension of inflammation by continuity of tissue, remembering the great thinness of part of the wall of the sinus, might account in the main for the symptoms.

Dr. Davis thought that the nerve affected might have been the accessory portion of the spinal accessory.

Dr. Finny thought that the simplest explanation was an abscess in the upper posterior part of the pharynx, and that it engaged the 7th nerve close to its exit from the stylo-mastoid foramen.

Dr. J. W. Moore, in reply, stated that both the motor and taste functions of the patient's tongue were perfect. There was no ear lesion and no hyperacuteness of hearing. As regards Dr. Finny's view, it does not seem to fully account for the first four days of the illness, when the patient suffered from giddiness, vomiting, and severe pain in her head.

SEQUEL OF A CASE OF MYXŒDEMA TREATED BY THYROID JUICE.

By JAMES LITTLE, M.D. Edin. (*et* Dubl., *honoris causâ*);

Physician to the Adelaide Hospital;
Ex-President, Royal College of Physicians of Ireland.

[Read in the Section of Medicine, March 2, 1894.]

I suppose we may now accept as an established fact that the juice of the thyroid gland of the sheep, when obtained with all due precaution, and injected under the skin with similar care, removes the symptoms of myxœdema. It is not, I fear, yet certain that the cure is permanent, and we are not as yet sure whether the administration of the thyroid juice by the mouth is as efficacious as its injection beneath the skin. The present communication to the Academy is intended as a contribution to our knowledge on these points. I had the honour of reading to the Medical Section in April last the details of a case of myxœdema which I had treated by the hypodermic injection of thyroid juice. In consequence of negligence in forwarding the manuscript to the Secretary the paper did not appear in the Transactions, and I will therefore briefly recapitulate the facts:—

Case.—On December 11th, 1890, Miss F., aged thirty-four, consulted me. In the autumn of 1886 she noticed that she had difficulty in kneeling; then her ankles became stiff, and when she walked they swelled. These discomforts continuing, she consulted a surgeon in July, 1887, and in the following October she went to Buxton, and, she thought, derived some benefit from her stay there.

When she came to me in December, 1890, she presented typically the symptoms and signs of myxœdema. Her family noticed her indisposition to exertion and her silence; she herself said she felt stupid. Her entire body was larger than it had been,

her neck fuller, and her abdomen so prominent that I was asked to examine her in bed, as her mother could not believe that her daughter did not suffer from a tumour. She needed collars and gloves larger than she had formerly required. Her face seemed swollen and had a mixed pale and livid look. Her fingers had become clumsy; she felt the cold terribly, and she was occasionally hoarse. Her tongue was large and pale, her appetite was good, but she often felt distended after food, and her bowels were confined. Menstruation was excessive, and in the intervals she suffered from leucorrhœa. Her pulse was sixty-eight, and the cardiac sounds short and sharp. There was no hum in the veins of the neck or in the pulmonary area. The disease appeared to be in a stationary condition, as the patient and her family had noticed no change for better or worse for two years. I advised the lady to take Turkish baths, and gave her tincture of jaborandi in half drachm doses thrice daily.

Eighteen months afterwards, in July, 1892, I saw her again. She had taken the jaborandi for twelve months. She had gone to the Turkish baths twice a week for five months, and afterwards at longer intervals. On the whole, she seemed a little better. She was less stupid and her face less swollen, but there was no material change. I then proposed to treat her by the thyroid juice, but as I was just leaving home it was agreed to postpone the course until the winter.

In November she came back. She had continued the Turkish baths, in which she perspired freely; she thought herself a little better, but her sister believed that this impression was due to the fact that the sufferer had become accustomed to her discomfort. She said she had a lumbering feel, as if her joints were stiff. She said she felt brighter, but activity was impossible owing to the stiffness of her body. The face was smooth, the nose and cheeks bright, the lips full and pale; she had a double chin, her fingers were big and dry and stiff; a ring which formerly fitted easily would not go on her finger; she had been obliged to get larger boots. Her breath was often offensive.

On December 4th I gave the first injection of thyroid juice, and I continued the administration until January 9th. She had altogether twenty-six injections; at first I gave two each week, but afterwards three. The fluid was kindly prepared for me by Dr. J. Alfred Scott with elaborate precaution. The weather at the time was very cold, and I avoided using any of the juice

which had been kept longer than forty-eight hours. The injection was made with one of the syringes with an asbestos washer, and I was careful to clean the syringe and thoroughly wash the skin with Jeyes' fluid before the operation. Except on one occasion, when I injected two syringefuls of the fluid, there never was the smallest local heat or feverish disturbance, and generally the lady got up and went about as usual an hour after my visit.

When making the first few injections I had difficulty in pinching up the skin, but towards the end of the course it could be caught up with ease, and the alteration in the entire appearance of the patient was very striking. She took part in conversation as she had not done for years, and felt lively and active. Her joints had become so supple that she could again use her needle with neatness. She no longer felt the cold with unnatural acuteness; her hands and feet were warm and her breath free from fœtor. Her face corresponded entirely with a photograph taken before she had fallen into bad health, and she told me that the black horny masses which had been on her knees disappeared during the treatment; and that on the head and nape of the neck, where her hair had become thin and poor, a new growth was appearing. I advised her to have a Turkish bath twice a week and to get herself well rubbed in it, and to take five minims of liquor strychniæ twice daily after meals. In the beginning of March, however, just two months after I had discontinued the injections, her family noticed that some of the signs were reappearing; the face had become a little dry, pale, and puffed; and her voice a little hoarse; she felt shaky about the knees; her under-lip turned out in speaking; and the fulness of the abdomen, which had almost disappeared, was again observable. Under these circumstances I advised the lady to try the thyroid glands internally, and from this time up to the present she has been doing so. The butcher who supplies her family has learned how to remove the glands and sends them to her fresh. Each week she uses two glands—half a one, say, on Monday and Tuesday, and again half a one on Thursday and Friday; she chips up the half gland, cleared of fat and capsule, and putting it in a spoon moistens it with a little beaune and swallows it after breakfast. She has also taken the strychnine. She looks and feels in every way as well as before the myxœdema begun. Painting, which the clumsiness of her fingers had rendered impossible, she has recommenced, and finds she can use her brush as well as ever. She has a luxuriant head of hair, and

BOSTON MEDICAL LIBRARY DEC 8 1898

instead of taking collars of 14½ inches she now feels comfortable in those measuring 13½, and wears boots a size smaller than she wore eighteen months ago. She has now gone to England, and, with my acquiescence, is to give up the treatment.

Dr. A. Paton mentioned the case of an old lady who suffered from enlarged face, hands, and feet, and whom he treated with 10-minim doses of the extract of the thyroid gland three times a day. The swelling diminished very much, as well as a hæmatoma present in the left ear. Her expression is still heavy and drowsy, but there is no return of the swelling in the hands and feet.

Dr. Hawtrey Benson said that last April he had narrated the history of a case of myxœdema cured by the internal administration of thyroid juice. He was happy to state that his patient was in perfect health still. She had taken small doses of the extract continuously since he had seen her. He thought that it was well always to begin the treatment of these cases by the internal administration of the juice, and if, after a fair trial, this method did not prove efficacious, to resort to the hypodermic method. It was not always possible to obtain the juice in a sufficiently aseptic condition for hypodermic injection.

The President remarked that it was interesting that it did not seem to matter much whether the juice were given by the mouth or under the skin. If it owed its activity to some body belonging to the class of nucleo-albumins one would imagine that gastric digestion would have some influence on its action.

Dr. Little, in reply, stated that some evidence existed as to harm being sometimes done by these extracts. A doctor in the Queen's County informed him that he had cured a patient of a large bronchocele by means of the extract, but that his patient had become greatly emaciated. He had himself noticed some rather alarming symptoms in two ladies, patients of his own. One of them, a hysterical girl, became very nervous and hysterical, and necessitated some nurses being engaged to watch her. In the other case the lady, after a few days, developed violent headache and pain in her abdomen, and similar symptoms came on after a fresh trial.

NOTE ON A CASE OF INSULAR SCLEROSIS.

By H. C. TWEEDY, M.D. Dubl.;

Fellow and Examiner, Royal College of Physicians;
Physician to Madam Steevens' Hospital.

[Read in the Section of Medicine, April 6, 1894.]

The following case presents some features of interest and points upon which discussion may well arise:—

Case.—L. B. [exhibited], aged twenty-three, a member of the Royal Irish Constabulary, was admitted to Steevens' Hospital on March 6th, 1894. The following history of his case is taken mainly from the careful notes of Mr. Cochrane, my resident pupil:—

The patient, a young man of robust appearance and florid complexion, had been for the past three years in the Royal Irish Constabulary. His father and mother are alive and healthy. He has had six brothers, one of whom died young from quinsy, the others are still alive, and all in perfect health. In June, 1889, he had an attack of inflammation of the lungs, and in 1891 he had a fall upon the back of his head while in the Depôt at the Phœnix Park; he cut his head slightly, but did not go off duty, and no unpleasant results followed. For three years past he had been in the habit of practising masturbation, and only desisted from this habit about a month previous to his admission to hospital. There was no history of syphilis. He was in excellent health up to December, 1893, when he was stationed at Carrick-on-Suir, Co. Tipperary. The first thing he noticed wrong was that his eyes failed him, and he could not read with comfort. This condition came upon him gradually, but still he was able to read with an effort.

About the middle of January he noticed that his power of walking began to fail. On February 1st he was attending Petty Sessions at Carrick, but on the 2nd he was unable to walk the five miles to the Courthouse, as he was much fatigued by the walk of the previous day, although when in good health he had walked twenty miles without fatigue. He went into hospital at Carrick-on-Suir on February 28th, and remained there until March 5th,

when he came to Dublin, and was admitted to Steevens' Hospital the following day.

His body was well nourished, and his limbs muscular. There was no evidence of disease of any kind in heart or lungs. His appetite and digestion were good. The urine was normal in quantity, colour, and specific gravity, and contained neither albumen, sugar, nor other morbid ingredient. He usually sat with his head and body tilted more or less to the right side. His face was expressionless, and he usually kept his eyes, to use a common expression, "screwed up," as if trying to steady his gaze upon something. When sitting or lying down he could move his arms freely into any position required of him; the same was true of his legs; but if asked to reach out his right hand to take hold of any small article he fumbled and made dives at it at first, but then apparently pulled himself together and made a better offer at grasping it each succeeding time. His head and his right hand sometimes showed a slight tremulous motion when he was excited. Ordinary sensation was markedly diminished on the right side of the body. If asked to close his eyes, and a coin or a penknife were placed in the right hand, he could not tell what it was; but if asked to shift it to the opposite hand he at once described what had been given him. In addition to the anæsthesia there was a slight, but only a slight, paresis of the right hand. The cutaneous and deep reflexes were normal, and there was no ankle clonus. He was quite unable to rise from the sitting posture without assistance, but when placed upon his feet the whole body seemed to become rigid, and the movements of the legs in attempting to walk were violent and spasmodic; he threw out his feet before him, and walked on the outside of each foot. When carefully propped up he could stand without assistance. He had no vertigo, nor was the ataxia increased when he shut his eyes.

Mr. Swanzy kindly examined his eyes for me, but found no gross lesion. There was no optic neuritis, and the pupils responded normally to light. Accommodation was also normal. There was, however, marked paralysis of the internal rectus muscle on the left side, and the left pupil was slightly larger than the right. There was also well-marked nystagmus on movement; this was best seen when he rotated the eyeballs to their utmost extent right or left. In the case of the left eye the nystagmus was not seen when he rotated the eyeball to the left, in consequence of the paralysis of the internal rectus. There was no sense of smell in either nostril,

the patient being unable to distinguish rose-water from tr. asafœtidæ. The mucous membrane, however, responded to ordinary stimuli, as he winced at the fumes of ammonia. Hearing was perfect on both sides. Ordinary sensation was diminished on the left side of the tongue, and the sense of taste was almost lost on this side, both anteriorly and posteriorly. Articulation was distinctly affected, the patient slurring his words, or else pronouncing them with an apparent effort; this, however, was less marked when he roused himself, and took pains to speak distinctly. There was not any atrophy of the tongue or lips, nor was there any difficulty in swallowing.

With such a complex array of symptoms it was not an easy matter to come to a rational conclusion as to the nature of the disease. To recapitulate briefly we have—

1. A spastic ataxia of the lower limbs on attempting to walk, though the legs can be moved in any direction when the patient is lying down or sitting.

2. Partial anæsthesia and paresis on the right side of the body.

3. Nystagmus, irregular pupils, and paralysis of left internal rectus.

4. Complete loss of smell.

5. Defective articulation, and loss of sensation and sense of taste on left side of tongue.

6. Slight tremors of head and right hand.

To contrast with these we have—

1. Normal reflexes.

2. Absence of optic neuritis and defective accommodation.

3. No headache, vertigo, vomiting, girdle pains, or lightning pains.

4. No rhythmic tremors or definite intention tremor.

5. No trophic disturbances.

6. No dementia.

It is quite evident that the case was not one of locomotor ataxy. It is equally evident that it was not a case of para-

lytic dementia, though it presents many of the physical signs of that disease. The absence of optic neuritis practically disposes of the likely supposition of a cerebral tumour. The absence of vertigo, vomiting, and occipital headache rendered it improbable that the cerebellum was at fault. In fine, I am disposed to think that the age of the patient, the nystagmus, the peculiarity of articulation, the spastic movements of the legs, point more in the direction of insular sclerosis than anything else. This supposition of isolated pathological growths would to a great extent harmonise with the symptoms present, as we know that the cranial nerves are often involved in this disease, and that for a certain distance a nerve may be grey and sclerosed, either in its entire thickness or in part; and here we have undoubted interference with the functions of the third and fifth nerves. This, again, would account for the fact that certain nerves—as the optic, the fourth, sixth, and facial—have escaped, inasmuch as the formation of the islets of sclerosis does not seem to follow any fixed law of distribution.

As regards the ætiology of the disease, this case seems to lend support to the opinion of Gowers, Strümpell, and others, that syphilis is rarely, if ever, found to be a factor in its causation. No evidences of syphilis could be discovered, nor did iodide of potassium, which was freely given at first, seem to have any effect upon the progress of the disease.

Query, had the persistent habit of self-abuse for three years a remote influence in giving rise to the morbid process in the brain?

Dr. Doyle suggested that the man, perhaps, might be a malingerer. He recalled a case exhibited at the Academy some years ago of a patient in adult life, and supposed to be suffering from "chronic chorea." It turned out that the patient had been under

treatment before and had learned the symptoms well. He proved to be a malingerer.

Dr. Burgess said he did not take Dr. Doyle's view, and he thought the most interesting part of the case to be as to whether the disease was functional or organic. If it were functional it would probably get well after some time. He thought that very likely it was due to masturbation.

Dr. Grimshaw narrated the history of a case he had seen in consultation many years ago. The patient was an athletic youth of nineteen, who had become partially paraplegic, and whose body used to be usually inclined to one side. There was thought to be something unusual in the appearances of the spinous processes, and the patient had an apparatus made for him, and was kept fairly quiet. He got quite well. Ten years afterwards he told him that he masturbated at that time, that he gave it up and recovered.

Dr. Tweedy, in reply to Dr. Doyle, said that he had no ground whatsoever for supposing this man to be a malingerer. As regards Dr. Burgess' view of its possibly being a functional disorder, the fact that he had not improved at all during the past month was against it.

AN UNUSUAL CASE OF GRAVES'S DISEASE.

By JAMES CRAIG, M.D. Univ. Dubl., F.R.C.P.;
Physician to the Meath Hospital.

[Read in the Section of Medicine, May 11, 1894.]

The patient whom you have just examined, and the drawing and photograph which I send around, are those of a girl suffering from Graves's disease, who came under my care in the Meath Hospital on May 11th, 1893. She was twenty-five years of age, unmarried, and had been in employment as a general domestic servant until December, 1892. During the summer of that year she had suffered from anæmia and palpitations, and had noticed her neck becoming enlarged; then in November menstruation ceased, and after a month of severe frontal neuralgia the eyes became prominent. There was no history of fright or mental emotion, or of any family neuroses. In January, 1893, she went to the South Dublin Union Hospital, where she fretted much, and after a time found her eyes become more prominent, and then red and painful. When she came under my care in the month of May her eyes were in a most alarming condition, of which the drawing and photograph give only a very imperfect picture. The eyeballs were markedly prominent, and the lower half of the bulbar and palpebral conjunctivæ of each eye formed a red protruding mass which buried the edge of the lower lids completely beneath it. The lower portion of each cornea was ulcerated, there was no anterior chamber, and in the right eye a small mass which appeared to be the lens lay on the swollen tissues. The upper lids were freely movable, and the conjunctiva underneath was red and congested, but free from chemosis. The sight was gone except that she could distinguish light from darkness. Pain was so intense that she had not slept at all for nearly the whole of the previous week.

With regard to other symptoms. Her pulse varied at short intervals from 120 to 170 per minute; the heart was weak, irregular, slightly enlarged, and with a pulmonary systolic murmur. The thyroid enlargement was not great, but was symmetrical, and

about the size of a small orange on either side, while pulsation and bruit in it were distinct. She was very nervous and excitable, and her hands and arms especially showed a constant tremor. She had suffered before admission from an exhausting diarrhœa, and complained of feeling weak and tired. The body was emaciated, and the mammary glands atrophied. The chest movements were much restricted during respiration—a symptom which has lately been pointed out by Bryson, of New York. She perspired freely from slight causes, and her skin always felt hot. The urine contained a trace of sugar, but no albumen. The skin was not pigmented except on the upper lids, and the appetite was small on admission, but afterwards it became voracious.

The condition of the eyes, however, was the special feature of the case, and one which called for immediate relief. Dr. Johnston kindly saw her with me, and divided the outer canthus of each eye with a pair of scissors; then on the following morning he made several incisions in the swollen mass of each eye by transfixing it with a narrow cataract knife from the corneal margin to the edge of the lower lid. The bleeding which followed considerably reduced the swelling, and as division of the canthi had allowed the eyeballs to protrude still further, the patient was so much relieved that she slept well that night. The remainder of the treatment consisted in the application of warm boric lotion, and subsequently the globe was covered by gold beater's skin on which a little boric ointment was spread. There was no active spreading ulceration of the cornea, and Dr. Johnston thought "the ulceration was partly due to exposure, and partly, perhaps, to pressure, although it was difficult to understand how the latter could act on the nourishment, nervous or otherwise, of only one half of the cornea." His idea in carrying out his line of treatment was that he would reduce the pressure on the globe, cause the eye to retract, and above all make the patient more comfortable. He also feared, if the eyes were left in the state of congestion or strangulation which was present, that pan-ophthalmitis would set in. The result was satisfactory in so far as it averted destruction of all the tissues of the eye and gave relief to the girl, but although the swelling somewhat diminished at the time, and acute symptoms subsided, the ulceration extended to the upper part of the cornea, and as the sight did not return and the swollen red mass still persists to some extent at the end of a year, it has been found necessary to place the girl in an asylum for the blind.

In the records of the numerous cases which I have examined, I can find no evidence that any eye complication so serious as this has ever before been observed. Gowers says:—"When the lids fail to cover the eyes, these are often dry in the morning—corneal inflammation is sometimes met with, apparently due to imperfect protection of the globe when the lids fail to meet; conjunctivitis is not rare, and occasionally there has been opacity of the cornea, and even sloughing, generally in both eyes, but in one before the other. Œdema of the lids is occasionally present, and may be associated with œdema of the conjunctiva." And Mr. Swanzy, in his Handbook on the Eye, says:—"The sensibility of the cornea is lessened. Ulcers of the cornea are not common, but are more often seen in men than in women. The exposure of the eye and the dryness of the cornea are probably to a great extent the cause of ulceration when it occurs; but Sattler inclines to the belief that it is also largely due to paralysis of the nervous supply of the cornea."

In a paper by Dianoux on "The Ocular Lesions in Exophthalmic Goître," read before the International Medical Congress at Copenhagen, in 1884, he expresses the opinion that stretching of the ciliary and optic nerves by the exophthalmos produces the internal eye lesions, which he classes under three heads—1st, the effects on motor organs, namely, dilatation of the pupil and paralysis of accommodation; 2nd, the effects on nutrition, namely, neuro-paralytic keratitis, papillary œdema and irido-choroiditis; 3rd, the effects on sight—namely, mist, shimmering, and finally amblyopia.

While I have gone so fully into eye complications in this affection, it may be well to mention in detail the more commonly observed ocular phenomena—1st, exophthalmos, which is present in about 90 per cent. of the cases, and which may be unilateral or bilateral, or more marked on one side than

the other, and which varies in degree according to the heart action; 2nd, von Graefe's lid-sign or impairment of the consensual movement of the upper eyelid in association with the eyeball on the patient looking downwards, and a modification of this has been noticed by Ramsay in the form of a spasmodic retraction of the upper lid after an imperfect descent; 3rd, Stellwag's sign, which consists in an incompleteness and diminished frequency of the involuntary act of winking; 4th, Dalrymple's sign or abnormal widening of the palpebral orifice, which is due to retraction of the upper lid—very rarely the lower lid has been retracted also; 5th, Möbius and others have observed paresis of the muscles that move the eyeballs, and even complete ophthalmoplegia has been noted; 6th, Tremor of the lids and tremor of the eyeballs have both been noticed, the former of little significance, as it is often seen in people in health, the latter a nystagmus which probably corresponds to the tremor of the body and limbs.

In this case of my own there was no secretion or appearance of acute inflammation, but the condition resembled rather that seen in the case of strangulated hæmorrhoids. And although there is some obscurity as to the cause of this serious complication, and as to its method of onset, we have at all events learned this lesson from it, that in all cases of Graves's disease where the exophthalmos prevents the lids from meeting over the eyeballs, every precaution should be adopted by the medical attendant to lessen the corneal exposure and reduce the proptosis. The methods that have been found useful for these purposes are, tightly applied muslin bandages over the eyes, the application of tincture of iodine to the upper lids, and when the protrusion is very great, the eyelids may be stitched together, or even, in order to lessen the palpebral orifice, the upper and lower lids should be united in the region of both commissures, by vivifying their

edges for some distance and stitching them together so as to bring about a permanent union. However, it is only right to mention that a young girl who was undergoing an operation of this sort died suddenly on the operating table at Guy's Hospital, in June, 1873, but this untoward result may scarcely be taken to prove more than that a tendency to sudden death exists in exophthalmic goître.

Since the three cardinal symptoms of this affection were first grouped together by Graves as a separate and definite malady, many additional symptoms have been described, some of which, like tremor, are almost constantly present, while others are found with more or less varying frequency. I cannot enter upon these at present, but most of them have been mentioned by Dr. Foot in his particularly interesting and instructive lecture on Graves's disease which appears in the second series of International Clinics. He there also calls attention to the undoubted right of associating with this malady the name of its discoverer—Graves—rather than that of Basedow. So that it is interesting to find, in the most recently-published German treatise on Exophthalmic Goître, an admission by the author, Dr. Mannheim, of Berlin, that in studying the history of the affection he discovered that Graves had known, recognised, and described the disease before Basedow, and that therefore one could not refuse to give him the priority and name the disease after him, "Morbus Gravesii," and this he adopts as the title of his work.

I could not attempt, within the space of a short paper, to discuss fully the various theories that have been put forward with regard to the pathology of this perplexing disease. But while it is almost universally accepted by writers on nervous diseases, and by pathologists generally, that the symptoms owe their origin to a functional or organic lesion of the central nervous system, but especially to that

part of it—viz., the medulla oblongata, in which are situated the cardio-inhibitory, vaso-motor, respiratory, and other involved centres, there are at the present day not a few who, following on the lines of Möbius, consider that the starting-point in the affection is the altered condition of the thyroid gland which, either by a hypersecretion or altered secretion, disposes of toxic agents to the blood, which in turn produce functional disturbances or minute pathological changes in the central nervous system. This latter view has lately received more attention on account of the recent researches that have been made in regard to the functions of the thyroid gland, but chiefly in regard to its atrophied state in producing the condition known as myxœdema, and to the highly successful results that have followed the treatment of this latter disease by some preparation of the gland itself when procured from animals.

In the first place I would mention briefly that the researches of Mr. Victor Horsley have gone to prove the importance of the thyroid gland as a blood-forming and metabolic agent. He says it forms, or rather secretes, from the blood a colloidal substance which is transmitted by the lymphatics from the acini of the gland back to the circulation, and that it is of special metabolic importance in early extra-uterine life, as shown by the more fatal effects of thyroidectomy in young animals as compared with older ones, so that its value falls as the general vital processes decrease. Its great importance in relation to health is shown by the effects that follow its removal in animals. These are—(1) a diminution in the corpuscular elements of the blood, and in the amount of its oxygen, with the presence of abnormal constituents in the plasma, such as mucin; (2) a general toxic state of the blood, which gives rise to excitatory and subsequently paralytic changes in the central nervous system, which are in turn evidenced by tremors, spasms, rigidity,

and afterwards motor and sensory paralysis; and, in the third place, derangement of nutrition follows, as shown by emaciation, increase of mucin in the subcutaneous tissues, and even later, fibroid increase, with heat changes also, in which the temperature is at first above and afterwards below normal, and in which the symptoms are aggravated by cold and ameliorated by heat.

So much, therefore, for the importance of this gland in the preservation of the economy of the body. Undoubtedly there is an increase or perversion of its functions in Graves's disease which one might readily assume to be the cause of many of the secondary symptoms, but those who support the view—among whom are Professor Greenfield and Dr. Byrom Bramwell, of Edinburgh—that the primary source of the malady has its origin in the altered gland, reason from the following data:—

1. The pathological state of the thyroid in exophthalmic goître.

2. The presence in the nervous system—particularly in that part of it which, from the symptoms, one would suspect to be involved—of slight but widespread changes which are of a like nature to those seen in toxic diseases, such as hydrophobia and tetanus, and therefore suggesting that these changes in Graves's disease may also be of toxic origin.

3. A comparison of the clinical features of myxœdema, in which the gland is atrophied, with those of exophthalmic goître, in which it is enlarged.

4. The beneficial effects on the disease of partial thyroidectomy.

5. The beneficial effects which follow medical treatment directed to reducing the size of the goître.

6. The correspondence, in some important respects, of the

phenomena of Graves's disease with those produced by artificial introduction of the thyroid secretion.

With regard to its pathological structure, Drs. Grainger Stewart and Gibson reported, at the British Medical Association, last August, the result of *post-mortem* examinations which had been made in three cases. And Prof. Greenfield, in "The Bradshaw Lecture," delivered before the Royal College of Physicians of London last November, recorded the result of his observations on six fatal cases.

In every instance there was a marked increase in the secreting structure of the gland, which Professor Greenfield considered bore the same relation to the normal gland as that which the mammary gland in lactation bears to itself when in a state of quiescence, and, in peculiar contrast to what has generally been accepted, the gland was found not to be very vascular—at least, the increase in vascularity was not more than is met with in a secreting mammary gland. Greenfield points out that great increase in the secreting tissue and greatly exaggerated function may be present without notable increase in volume. In advanced stages of the disease fibrous overgrowth may replace the secreting structure, and in that case one might expect a subsidence of the symptoms; or even if the glandular atrophy is extreme, myxœdema may ensue—a sequela which, it is true, has been sometimes observed. Coming to the next point in the argument, although the changes found in the nervous system are not by any means constant, still minute hæmorrhages and degenerative changes are frequently met with which closely resemble the conditions that are observed in diseases like tetanus and hydrophobia, which are believed to be of toxæmic origin.

In contrasting the clinical features of myxœdema with those of Graves's disease, the following points are called attention to:—

In Exophthalmic Goître.	*In Myxœdema.*
1. The gland is hypertrophied.	1. It is atrophied.
2. Young women are affected.	2. Older women suffer.
3. There is hyperexcitability, nervousness, tremors, and unrest.	3. The patient is stolid and placid.
4. The skin is soft, smooth, moist, with excessive perspiration and diminished electrical resistance.	4. The skin is dry, harsh, rough, no sweating, and increased electrical resistance.
5. There are subjective sensations of heat (flushing) with easily produced elevations of temperature.	5. There is a feeling of coldness with subnormal and unvarying temperature.
6. The pulse is frequent.	6. It is slow or infrequent.
7. There is marked emaciation.	7. There is increase in weight and bulk.
8. Amenorrhœa is common.	8. Menorrhagia is more common.
9. Marriage and pregnancy may cure.	9. Pregnancy very rare, but when it occurs patients get worse.
10. Mental disorder more usually takes the form of acute mania.	10. Melancholic delusions are more often met with.

We next come to consider the beneficial effects of partial thyroidectomy.

Stierlin collected 29 cases in which portion of the gland was removed, and in 22 of them complete recovery ensued. Wette collected 26 that he considers "undoubted cases,"

in which removal of portion of the gland was followed by considerable improvement, and often by a distinct cure—in fact, he says that the altered gland is the cause of the disease, and that operation is the only satisfactory treatment.

Putnam, of Boston, has found removal successful in curing the disease, but says that while there is little risk of death, there is great risk of considerable temporary prostration and laryngeal paresis.

Frieberg, of Cincinnati, recommends it in severe cases that will not yield to medical treatment.

Booth and Newton, of New York, have also recorded satisfactory results from operation.

There is not much to be said either for the beneficial effects of medical treatment directed towards reducing the size of the gland, or to the fact that the introduction of thyroid juice into the system in health produces certain effects similar to symptoms of exophthalmic goître. Certainly pressure, ice, and the inunction of red iodide of mercury externally, and the administration of belladonna and ergot internally, all of which may be said to aid in reducing the size of the swelling or in diminishing the secretion, have been credited with at least as good results as any other therapeutic agents. The administration of the juice in health has been followed by relaxation of the arterioles, rapid heart action, diuresis, slight rise of temperature, &c.; and an overdose in myxœdema has produced flushing, excessive perspiration, muscular spasm, tremor, tumultuous heart action, rapid pulse, and death from cardiac failure.

Now, while all these arguments seem more or less to favour what I may call the "glandular theory," and to prove that the goître is the cause of the other symptoms, lest anyone should be led to adopt this view from the plausible arguments set forth, and to consider that we should at once hand over our cases to the surgeon for the purpose

of curing them, I will touch shortly on the other side of the question.

In a number of cases of exophthalmic goître a complete cure has followed the removal of a nasal polypus, or the cauterisation of a thickened nasal mucous membrane, while some instances of complete recovery are recorded in which practically no treatment at all has been adopted. Guttmann about 12 years ago practised thyroidectomy without any result. Kocher, of Berne, had a case which died the night after operation, and four cases in which no result was notified, and he says the patients have as little chance of recovery from operation as if they suffered from malignant goître. Strümpell in one case partially removed the gland, and the patient died. While Mannheim, as the result not only of great personal observation, but also of extensive research in the literature of the subject, considers that unless for urgent dyspnœa operation should not be undertaken; and he asserts that only twelve of Wette's cases were genuine Graves's disease, and of these, three were unsuccessfully operated on, two were moderately successful, and the others were doubtful. Four of his own forty-one cases were operated on, and only one seems to have obtained partial benefit. He says the most successful treatment is a dietetic and hygienic one, which insures physical and mental rest in the widest sense, and that experience shows electricity to be useful; but the utmost that therapeutics can effect is a perceptible improvement, while a complete cure is beyond it.

In conclusion, it may be of interest to mention that this disease has been observed in animals. Two cases are reported from St. Petersburg—the first, that of a four-year old thoroughbred horse, which after a long gallop exhibited abnormally strong and frequent arterial pulsations, cardiac palpitations, and progressive weakness; the thyroid body was found tumefied, and sixteen days after marked double

exophthalmos appeared, and after a month's illness the colt died. The second case was that of a small pet bitch, 7 years old, in which the cardinal symptoms were present, but were cured with iodine in three months. In the Veterinary Reports for the Kingdom of Saxony, 1890, Roder cites the case of a cow in which palpitations, arterial pulsations, enlarged thyroid, and intense double exophthalmos had existed for four years. Finally, a somewhat doubtful case has been reported by Professor Cadiot, of Paris, in which a gelding exhibited cardiac palpitation, a bounding pulse, great hypertrophy of the thyroid gland, but no exophthalmos. A reference to these interesting cases will be found in the *Lancet* of August 20th, 1892.

Sir Wm. Stokes said he had seen her shortly after her admission to hospital. The chemosis of the conjunctiva and the exophthalmos, especially the former, were much more striking then. As regards the surgical treatment of cases of this class, he suggested, in lieu of thyroidectomy, which was always a serious and difficult operation, the exposure and division of the isthmus of the thyroid body. He had performed this operation in three cases of goître, in two of which a marked and beneficial result took place, while in the third case no change took place. The size of the thyroid became much less in two of them.

Dr. H. C. Tweedy said that many years ago he had seen inunction of red mercurial ointment tried in one of these cases, with the result that the patient's sufferings were much increased.

Dr. W. J. Thompson asked what line of treatment had been adopted in the present case. He had heard that in some cases there had been observed *post-mortem* changes in the inferior cervical ganglion.

The President said that it was worthy of note that there had been no history of a fright previous to the development of the disease. Many cases had occurred immediately after the Franco-Prussian war. This is interesting, as it may indicate the direction in which to look for the solution of the pathology of the disease. The chemical theory was a new one, and it showed that we might

have diseases caused by a plus and minus derangement of the gland. It did not, however, explain the much greater frequency of the diseases affecting the gland in the female. Were we to assume that the metabolism of the female was different from that of the male body? As regards the treatment, spontaneous recovery was not so rare as might be concluded from reading the text-books. Some years ago he had seen a young woman, in consultation with Dr. Ball, and she then appeared in imminent danger of dying. She subsequently got quite well. He wished to know had ligature of the arteries going to the gland been tried with a view to, as it were, starve it.

Dr. Craig, in reply, stated that in regard to Sir Wm. Stokes' suggestion that in some cases division of the middle lobe might do good, this procedure was only of benefit in cases of goître but not in cases of exophthalmic goître. The superior and inferior thyroid arteries had been ligatured but without much good result. As regards drugs, belladonna and ergot he believed to have been the ones most generally found useful. He had applied to the conjunctiva of his patient's eyes, to remove the local affection, resorcin with some good result, and silver nitrate with less effect.

NOTES ON CASES OF A SEVERE TYPE OF INFLUENZA.

By JOHN J. BURGESS, F.R.C.S., L.R.C.P.

[Read in the Section of Medicine, May 11, 1894.]

For several years Europe has been overrun by a disease which has gone by the above name, La Grippe, Dengue Fever, Russian Catarrh, and others—occurring in epidemics of great severity in the latter part of winter—during the spring, and continued in the early summer, from which, according to many observers, there appears to be no immunity in the individual attacked from succeeding onsets, which spreads equally everywhere amongst the rich as among the scantily-nourished poor, in dwellings where modern hygienic science has minimised the risk of infectious disease as amid the squalid lanes and alleys of large cities.

Though our city, if we take the published accounts, has apparently not suffered from so severe types of the malady as London and the Continental centres—viz., St. Petersburg, Paris, Vienna, or Berlin—yet during the past four years we have had ample opportunity to study La Grippe in its various phases. I do not intend to give a description of the different types, which has been previously ably done in a valuable paper by Dr. John W. Moore, but I wish to bring before you a few examples of a severe and peculiar form of lung disease, which, occurring during the prevalence of the epidemic, must rationally seem to belong to the prevailing disease, as well as to solicit opinions on the following practical points:—

1. Are the severe types (to be described) merely exaggerations of the common febrile form in persons who have adopted no precautionary measures when attacked?

2. Are they special forms which attack internal organs primarily, simulating the malignant types of fevers?

3. Does the treatment by medicines, beyond the primary relief of the pain in the mild form, do any real good?

4. Does one attack confer an immunity?

Case I.—The first case is one of adynamic pneumonia, with questionable myocarditis. A lady, Mrs. P., aged fifty-six, slight but usually healthy, suffered from a succession of chills at the end of last November, with severe frontal headache and pain over the trunk and limbs. At the time she was complaining there were some children in the house in which she was staying, sick with measles. Against my advice she would not remain in her room but insisted on looking after them, which necessitated her changing from room to room through the cold draughts of the house. She had slight laryngeal cough but no chest affection.

About a week after first feeling unwell she had a severe rigor, followed by a rise of temperature to 103°, with extreme pain in the right side shooting through to the scapula behind; her face was pallid and rather dusky; the respirations and pulse were quick; there was great restlessness, and almost constant vomiting. On the right side the vesicular murmur was weak and rather jerky anteriorly; behind there was a loud friction murmur which obscured the pulmonary signs. The heart sounds were sharp and the impulse weak. Next day the face was dusky, the capillaries appearing as purple spots. The temperature was subnormal—97°. The pulse and respirations were respectively 120 and 40. There was dulness corresponding to the right pulmonary base with crepitus and tubular breathing. The vomiting was not quite so severe, and the pain had disappeared under treatment. The sputa presented nothing remarkable, being scanty and bronchial. For the next three days, despite everything, she rapidly sank. The face was cyanotic. The respirations and pulse remained accelerated. The temperature was 96°–97°. There was occasional delirium. The dulness extended over the entire posterior aspect of the lung without primary crepitus, with most intense tubular breathing.

There was coarse crepitus in front corresponding to the sixth intercostal space and normal resonance.

Dr. Walter Smith saw her in consultation, but she was then moribund and sank into coma, and died on the evening of the fourth day of the lung seizure.

The treatment in the early stages consisted of salicylate of sodium and antipyrin, with morphin and atropin hypodermically to relieve the pain. On the occurrence of the cyanosis, quinine and digitalis in effervescence was substituted, with dry cupping locally; at the same time brandy and champagne were given freely. The peculiar symptoms in this case were the subnormal temperature, with rapidly-spreading consolidation of the lung, the temperature, except on the first day, never rising above 97°, without the corresponding fall of the pulse and respirations noticed by several in this form of pneumonia. 2. Again the early cyanosis, before there was much implication of the lung. 3. The nervous symptoms—restlessness, sleeplessness, vomiting, and occasional delirium, without headache.

Case II.—The second case is one of very acute bronchitis with broncho-pneumonia. P. K., drayman, intemperate, florid, and of powerful physique, was first seen on the 14th Jan.; he had been suffering from a cold for some days previous, but paid no attention to it until he felt no longer capable of working. He was suffering from acute bronchitis of the large bronchi, which extended on the following days to, first, the small tubes, then to the alveoli of, primarily, the right base, and on the succeeding day implicating the base of the left lung. His temperature was 104°; pulse, 132; sputa bronchial. Almost simultaneously with the latter extension he complained, as a fresh symptom, of a lancinating pain on inspiration from the crest of the right ilium up to the corresponding shoulder. This gave him great trouble, was excruciating when he had to cough, and gave great apprehension on his part that, owing to the suppression of forcible expulsory efforts, he would be suffocated with the abundant mucus he felt unable to expectorate. There was at the time a friction murmur audible

under the right nipple, with dulness and diminished breath-sounds at the posterior aspect of the lung. After a short time the pain disappeared, due, I believe, to morphin and atropin administered hypodermically, and the temperature fell to 100°, the pulse still remaining quick—120. His condition then was: coarse crepitus and increased vocal resonance over the left posterior pulmonary region, with extreme dulness, absence of vocal resonance and respiratory signs over the entire right side behind and laterally. The dulness extended up to the spine of the scapula and forward to a line dropped vertically from the front of the shoulder through the axilla. This dulness did not alter by position or extend to the opposite side of the sternum. Anteriorly there was normal resonance over both lungs, with loud dry râles. A hypodermic needle was several times inserted over the dull region in different spots without disclosing any evidence of fluid more than a drop or two of blood. This condition persisted for six days, when a change for the better appeared; the temperature became subnormal; the left side crepitus and the râles in front ceased, but the dulness on the right continued and the pulse remained quick. For three days he rapidly improved, when unfavourable symptoms set in again. His temperature rose to 100°; loud râles were again present over the whole chest, excepting the dull portion, which remained unaltered; sleep was impossible owing to the constant coughing up of large quantities of aerated, gummy-like mucus, while he was bathed in profuse sweats. After five days, during which his condition was practically unaltered, the râles became moist, and the expectoration changed to muco-pus and subsequently pure pus; his temperature again fell to below normal, and never rose higher than 97° afterwards; still there was no relief, and sleep became impossible from attacks like bronchial asthma which occurred every night. During all this time there was neither fœtor nor cyanosis.

The next serious symptoms which appeared were retention of urine followed by diminished secretion, then loud gurgling râles over both lungs, audible now for the first time over the dull area, and finally rather sudden death due to cardiac syncope.

The treatment at first was iodide of potassium, followed, on the presumption of the dulness being due to fluid, by saline cathartics and diuretics, then quinine and digitalis.

Free use of brandy, and, locally, cupping, and blistering with cantharides.

This case owes its interest to—1. Its duration—29 days—with the persistence of acute bronchitis throughout. 2. The absence of nervous symptoms, the sweating being due to toxic causes. 3. The occurrence of such extensive dulness without breath or voice phenomena, leading me to believe that it belonged to those rare types of the "pneumonie massive" of Grancher, also described by Skoda, in which sound cannot be transmitted owing to infarction of the larger bronchi with mucus. (My friend Dr. Tweedy gave me the particulars of a somewhat similar case which came under his observation at Steevens' Hospital). 4. The supervention of renal complications, without uræmic symptoms. 5. The low temperature, as in the preceding case; and 6. The absence of dyspnœa or cyanosis until just before death, with such extensive disease in both lungs.

Case III.—F. K., aged forty-one, shopkeeper, tall, rather stooped, delicate-looking, came to me in March, 1893, complaining that a fortnight before "he had been treated for an attack of influenza and didn't feel himself getting better." His appearance was that of a man who had been suffering from hectic in the course of some prolonged wasting disease: his face was pale and of a leaden tint; his respirations were rapid and shallow; his temperature was 103°; pulse, 128, weak; tongue slightly furred in centre. He had been losing flesh rapidly, had a troublesome cough with expectoration and night sweats. The peculiar symptom about his case was the cough; it was violently paroxysmal, like whooping-cough; on its occurrence he would jump up from where he was sitting, double up his body, and beat the air with his hands as if he were suffocating. At the end of this spasm he would hawk up with difficulty a small quantity of dark mucus, from which the fœtor was simply intolerable, making him vomit. This peculiar odour was confined to the expectoration after fits of coughing. During the interval his breath had no bad smell. I made a careful examination of his nasal fossæ with the rhinoscope, but found no ozæna or other diseased condition, and expiration through the nose

was odourless. His chest presented nothing out of the normal, except that under the right clavicle there was a faint click on deep inspiration.

Under treatment the fœtor disappeared, the sweats ceased, he gained flesh, and although the cough did not entirely go away it lost its paroxysmal character, and there appeared no further symptom of disease in the right lung. By my advice he went to the country, and after three months he again presented himself for examination. The cough had nearly ceased; once or twice there had been fœtor, which did not persist; his pulse, temperature, and respirations were normal, and his weight had increased.

Some time after this he had a sudden attack of hæmoptysis, which repeated itself several times, and, seeking advice elsewhere, he was informed that he was in the last stage of consumption. He then sought and gained admission to the Hospice. There, however, he rapidly improved, and affairs were not found to be so bad as were represented, so that he was discharged.

He came again under my care immediately, and on a careful examination I could find no trace of disease in either lung; his temperature and pulse were as in health; there was some cough, which I believe to be due to a very irritable condition of his pharynx, as he had complete intolerance of contact with any part of it, and could not bear an ordinary tongue depressor within his mouth. At my wish he was twice examined by Dr. Richard Hayes, who agreed with me that there was no trace whatever of disease in either lung, except that his vocal resonance was slightly accentuated over the right clavicle. He is now in as good health as ever. The treatment tried was, first, antiseptic inhalations, which had to be discontinued because they increased the cough. Guaiacol capsules were substituted, which quickly removed the fœtor; then tonics and fresh air.

Case IV.—J. H., twenty-three, rather stout, medium height, pale but healthy. Got a chill in January, followed by intense pain in the back of left lung; temp., 101°; pulse, 120; respiration, 40; not much cough; scanty expectoration. On auscultation a loud friction murmur was heard over the painful area. Dulness, with tubular breathing, succeeded over the entire posterior aspect of the left lung, gradually extending across the axilla to the anterior lower pulmonary region up to the nipple. Above this was a peculiar sign—extreme tympany, like the note produced over a distended stomach, with

considerably diminished breath-sounds, which in six hours was succeeded by complete dulness with tubular breathing. There was no displacement of the heart. His respirations and pulse during this period were rapid; there was considerable cough, with aerated red (bloody) sputum in abundance; his temperature was 101°–102°, not tending to run high. He was seen in this stage by Dr. Little in consultation, who pronounced the case as one of genuine La Grippe. This state of affairs continued about a week without any important change, when the tubular breathing gave place to coarse crepitus over the entire lung, but heard only faintly at the inferior portion behind. The lung was apparently clearing up in front, but the breath-sounds became fainter posteriorly until they were inaudible up to about a point half way to the angle of the scapula. When this condition had gone on a few days he felt, during a fit of coughing, something giving way, and suddenly a great gush of pus, unaerated and similar to what is seen in empyemata, came pouring through his mouth and nose, nearly suffocating him. Immediately after this had taken place loud gurgling sounds were heard at the base of the affected lung, which cleared off, leaving amphoric breathing, thereby showing the presence of a large cavity near the chest wall. After a week this cavity again filled with fluid, and again the breath-sounds ceased over the left base; his temperature ran up until suddenly a similar accident happened, and the pus found vent through the mouth; this occurred a third time, the quantity in each being over a pint, not coughed up at once but coming in one great gush and followed by expectoration of smaller quantities, varying from a teaspoonful to an eggcupful, generally for two days; this last was due to the pus getting sucked into other parts of the lung by inspiration, and evidenced by crepitus heard all over the organ under the stethoscope. After the third flow of pus convalescence rapidly progressed; there were signs of cavity corresponding to the situation of the disease for some time, when these finally disappeared, leaving him well again, but rather shaken by the severe battle he had for his life. The treatment in this case was the ordinary one for pneumonia, and requires no mention.

The last two cases are of interest as examples of somewhat exceptional pulmonary complications. Notwithstanding its rarity, I consider the first as one of that form of gangrene

of the lung first described by Lasegue as gangrène du poumon curable; and this gangrene is evident from the following symptoms:—

1. The short duration of the cough, with the previous history of immunity from any bronchial trouble.

2. The appearance of the patient, with the peculiar leaden tint of the face.

3. The septicæmic symptoms, high fever, sweating, and emaciation.

4. The constant recurring attacks of hæmoptysis.

5. The peculiar absence of symptoms of pulmonary disease on auscultation, as remarked by Stokes in several cases.

6. And more particularly, and the point to which I attach most importance, the horrible fœtor.

The above exclude bronchiectasis and chronic pneumonia; the absence of abundant discharge negatives fœtid abscess or empyema—the only disease remaining which might be confounded with this case was fœtid bronchitis.

There was no examination of the sputum made to determine the presence or not of elastic fibres, but the absence of any of the signs of chronic bronchitis, especially the healthy state of the opposite lung, were, taken together, factors, in the absence of the more confirmatory test, to my forming the above diagnosis.

Again, the breath was not continuously fœtid, but only during and immediately following a fit of coughing.

That gangrene has been noticed after pneumonia of influenza is evidenced by the six cases, occurring in one week at Guy's Hospital during the epidemic of 1847, reported by Hughes.

The second case is remarkable for two things:—First, the amphoric resonance over the upper part of the chest, corresponding to the sound described by Biermer as the bandbox sound. Secondly, the situation of the abscess. This

extreme resonance is of rare occurrence, and formerly created considerable attention. It was first noticed by Graves in 1837; then Stokes gave it the name of pneumothorax of pneumonia, he believing that in these cases the pleura secreted air. Cases of it were afterwards described by Skoda and Hudson. Gee states that it existed when islets of pneumonia were scattered through a lung containing air. Williams called it the tracheal resonance, and stated it was due to consolidation of the left upper lobe, the sound being caused by air in the bronchus, which is longer on this side, being forced by percussion into the trachea. Guttmann gave as explanation of its occurrence that it was due to diminished tension of the air sacs from the necessary hyperæmia, due to other parts of the lung being impervious. This latter does not explain why the symptom occurs so rarely; when the conditions are favourable to its production large pleural effusions are very common. It was far in excess of the hyper-resonance we find above the level of an empyema; it resembled exactly the note over a distended stomach. Its distance from that organ, and the dull note elicited by the portion of consolidated lung lying over the left leaflet of the diaphragm, dismissed the possibility of transmitted sound.

Again, as to the source of the pus. It resembled the fluid of a pleural abscess in quantity and appearance. The diagnosis lay between abscess of the lower left lobe or encysted pleuritis. My own idea was in favour of the latter from the symptoms:—

1. The lung sounds were gradually obliterated from below upwards.

2. The occurrence of the bursting of the abscess did not correspond with the acute stage of the lung trouble.

3. The second and third repetition of the above, as if a pleural cavity had filled up drop by drop.

Against these were—

1. There was no pneumothorax.

2. The amphoric breathing extended over an area of about one square inch, which would be rather smaller than I would expect a cavity of the pleura to be, containing so much pus.

3. There was no sound elicited by succussion.

4. The course of the pneumonia corresponded to those described by Stokes as acute asthenic pneumonia, causing cases abscess in the lower portions of the lungs.

5. There was neither bulging of the intercostal spaces, nor displacement of the spleen.

In Cases I. and III. there was decidedly a manifestation of the febrile form before the chest symptoms set in, and they were probably due to want of proper precaution, but I believe this sequence exceptional. In the majority of the cases of what might be called influenza pneumonia (the asthenic creeping variety) I have scarcely ever found that there was a preceding period of illness; conversely, with the exception of the above two, I have never found pneumonia develop as a sequel to the ordinary form. In the treatment of this febrile type the salicin preparations, as well as phenacetin and antipyrin, certainly relieve the headache. I think the growing superstition against antipyrin is unwarranted; there is a period in influenza where a tendency to faintness comes on, whether the patient has had the drug or not. From my own experience I have never seen the slightest dangerous symptom from much larger doses than are generally given at present.

Do nux vomica and its preparations do any good in the stage of depression which follows so persistently in the decline of the disease? For my part I have not derived the slightest benefit from them; in some cases they even appear to do harm by increasing the prostration. Quinine, caffein, and coca and its preparations were in my cases

valueless. Cold sponging appeared to cause an improvement superior to medicine.

Does one attack confer an immunity? Many believe it does (not total), but modifying like vaccina to small-pox. I have formed this opinion from attending a number of men and their families working in two of the large industries of our city, and by keeping a record for the past four years of each case. I have during that period only once seen two severe cases of influenza in the one individual, and have noticed a peculiarity in individuals attacked more than once that there does not appear, in second or later attacks, to be the prolonged depression, both mental and physical, which is so peculiar a factor of the disease present.

In conclusion, I will again refer to what might be a possible objection to these cases being classed under the above heading—namely, that they are cases of pneumonia which might occur at any time, but they are cases of pneumonia of a peculiar nature, creeping from one part of the lung to the other, attended by profound depression and subnormal temperature, not terminating by crisis, subject to sudden exacerbations, and having what might be comprehensively termed a malignant tendency, with the presence at the time of the epidemic spread over the entire city.

Dr. W. G. Smith said that he agreed with Dr. Burgess that post-influenzal pneumonias were peculiar. They lacked the characteristic rusty sputum, crepitus over the lungs, and were frequently complicated by limited pleural effusions. The bandbox sound he frequently observed in cases of pneumonia and of pleural effusions. As regards the treatment nothing was of much avail, except in the early stage, when you could lower the temperature and relieve the headache. Careful nursing, careful feeding, and rest for a sufficient length of time were what were needed after this.

Dr. W. J. Thompson said he had attended a gentleman who, in 1892, had a moderate attack of influenza. In May, 1893, he was

seized with chilliness, and his temperature rapidly rose to 106°. He had cyanosis of his face, headache, and pain in his back and legs. He treated him with large doses of antipyrin and salicylate of soda, as well as some carbonate of ammonia and digitalis. His temperature in a couple of days had fallen and he recovered.

Dr. Craig said that he had frequently noticed that the apex and anterior parts of lungs were affected in pneumonia following influenza. He relied on stimulants very much in the treatment of these cases, especially in people past middle life.

Dr. Burgess briefly replied.

CASE OF THROMBOSIS OF THE PORTAL, MESENTERIC, AND GASTRIC VEINS.

By WALTER G. SMITH, M.D.;

President of the Royal College of Physicians of Ireland;
Physician to Sir Patrick Dun's Hospital.

[Read in the Section of Medicine, December 15, 1893.]

A young man, aged thirty, sought advice at Sir P. Dun's hospital on account of cramps in the stomach and lightness in the head, attended with shivering fits. He was anæmic; the legs were swelled, but there was no albumen in the urine, either then or subsequently. Some months later be was admitted into hospital for severe abdominal pain, which had set in 13 days previously. He was very weak, and suffered from dry retching. His colour was sallow yellow; no leucocytosis. The abdomen was tensely distended and very tender. It was dull at lower part and sides, and fluctuation could be detected. No enlargement of the cutaneous veins. A systolic murmur was heard over the heart, at base and apex. The bowels were loose—four or five pasty motions in a day—and there was moderate pyrexia. He steadily became worse, and died in collapse, after a week's stay in hospital.

Post-mortem.—Liver normal in size, very hard and tough. Nodular cirrhosis, especially on under surface of left lobe. Gall bladder flaccid. About two and a half quarts of thin serous fluid escaped from peritoneum. Spleen enlarged and firm. Portal vein adherent to structures in transverse fissure. It was much dilated, and its coats thick (about 3 mm.) and leathery—not calcified. Its interior was occupied by a firm yellowish granular thrombus adherent at one side to the vein but not completely obstructing its lumen. Branches of portal vein through the liver filled with soft thrombi, closely fitting, and yet capable of being withdrawn. Mesenteric veins occluded by soft red thrombi. The jejunum, for about one foot, was adherent to ascending colon by soft recent lymph. There was acute recent peritonitis over liver and over this portion of the bowel, which was intensely congested, and nearly black, resembling a strangulated intestine. No blood in its

interior; mucous membrane eroded. The walls of the rest of the small intestine much thickened by œdematous swelling. Several veins near pyloric end of stomach firmly thrombosed. Pleural adhesions existed on each side, and there was effusion into the right pleural cavity. The probable order of events was—(*a*) cirrhosis of liver, (*b*) thrombosis of portal vein, (*c*) sudden extension of thrombosis to gastric and mesenteric veins, (*d*) peritonitis.

Dr. Tweedy said that at present there was under his care a woman suffering from ascites. Laparotomy had been performed three months previously. She has been tapped eight or nine times within the last three months, and last time he drew off more than 400 ounces of fluid. In the absence of any evidence of hepatic or other disease likely to cause the ascites, he made a provisional diagnosis of adhesive pylophlebitis.

Dr. Bewley said he had seen two cases of thrombosis of the portal vein. In one, the patient suffered from cirrhosis of the liver and dropsy, and also a good deal of abdominal pain. An autopsy revealed a rather soft clot in the portal vein without any involvement of the mesenteric veins. The second case was that of a man suffering from vomiting, pain, and distension of the abdomen. The bowels were obstinately constipated and a laparotomy was performed. About one foot of the small intestine was found to be in much the same condition as in Dr. Smith's case. There did not seem to be obstruction to the passage of matter through it. The man died shortly afterwards, and at the *post-mortem* it was found that the mesenteric and portal veins were thrombosed, as well as some of the deeper veins of the abdominal wall, where the laparotomy incision was made.

Dr. Smith replied.

A CASE OF CANCRUM ORIS IN TYPHOID FEVER.

By H. T. BEWLEY, M.D., F.R.C.P.;
Assistant-Physician to the Adelaide Hospital, Dublin.

[Read in the Section of Medicine, January 19, 1894.]

ALTHOUGH cancrum oris has long been known, it is a disease about which a great deal of uncertainty prevails. It occurs among poor, dirty, and delicate children, and even in these some fever must still further lower the vitality before it comes on. Mercury, too, is thought to predispose to it, if not to cause it.

With regard to the mode of commencement of the gangrene I quote from Eulenberg's Cyclopædia of Medicine—"It is doubtful where the disease begins, whether in the mucous membrane as an ulcer or an inflammation, or in the submucous connective tissue as an infiltration which subsequently involves the mucous membrane; the first view is the more probable. Doubt also prevails as to the nature of the changes in the tissues which precede the gangrene. Clinical observation would seem to show that the disease is characterised by an inflammatory process which rapidly leads to gangrene, and not by a primary necrosis."

As to the morbid anatomy of the disease, the slough is composed of *débris* of tissue, putrefactive organisms, &c., while round it the tissues are infiltrated with serum and leucocytes, and the blood vessels are dilated.

It seems that the disease must belong to the class named by Harrison Cripps, in Holmes' System of Surgery, "Specific Septic Gangrenes," and that it must be caused by some organised virus. Many attempts have been made to find

this organism. Sanson, in 1877, described small, highly refractile bodies, about one-twentieth the size of a red blood corpuscle, which he found in the discharge from the sore, as well as in the blood, urine, and fæces. Since then, however, he has failed to find them in cases of cancrum, and has discovered them in cases suffering from other diseases. Schimmelbusch of Cologne, Coates, Lingard, and Elder of Edinburgh, have all described bacilli growing out into the tissues round the necrotic patch; but the bacilli of one observer seem to differ from those of another. Those of Coates are anaërobic. Those of Schimmelbusch, when inoculated into the corner of the mouth of rabbits, caused small ulcers. As yet we cannot say if any or all of these bacilli are the virus of cancrum. Inoculation has not reproduced the disease; it is not likely that even the true virus would do so, because it is improbable that a germ, which can only exert its influence in human beings when in the most extreme degree of exhaustion, should be able to excite the disease in healthy animals. The malignancy of the organism must be slight.

Cancrum oris is, I think, now-a-days a rare disease. I have myself seen only two cases. One was a child who had suffered from measles, who was brought into the surgical ward of the Adelaide Hospital with its cheek all sloughed away; it died soon after admission. The other case is the subject of this paper.

The disease occurs most often after measles, less often after typhus, scarlatina, and small-pox. In typhoid it is a rare complication. Murchison met with it only once; he adds, "it is usually fatal." Other writers only mention it as a very rare occurrence. The only recent report of a case of cancrum oris in typhoid that I have found is a brief note by Dr. F. Taylor of a case presented by him to the Clinical Society of London, in October, 1893. The patient was a girl,

aged eleven. Suppuration began at the root of a tooth, and thence a sloughing process started. It was treated by a 10 per cent. solution of carbolic acid, applied every half hour, and afterwards by nitric acid used under an anæsthetic. Recovery took place, but with contraction of the mouth.

CASE.—My patient was a boy, aged fourteen, who had always been healthy and strong. His family history is favourable, except that, I believe, his father drinks. About September 5th, 1893, he began to lose appetite, and suffer from headache, and loss of strength. He grew worse, and was admitted into the Adelaide Hospital on September 13th. When admitted he was feverish, his evening temperature being about 102°, and his morning temperature about 100°; his tongue was furred; he was thirsty, but had some appetite. His bowels were confined, and an enema was given him every second day, the motions being fluid and light-coloured. The thoracic and abdominal organs were normal; spleen not enlarged—a few spots present. He slept fairly well. His diet consisted of three pints of milk and a cup of tea morning and evening.

For a week after coming into hospital his illness seemed slight. However, about the end of the third week of his illness—September 27th—he became much worse. His temperature rose to 104° or 105° F. every evening, and the morning remissions became less marked; his pulse became more frequent, being 116–120 in the minute; his abdomen became exceedingly tense, distended, and tympanitic all over. At the same time his nervous system suffered; he became first dull and heavy, then almost wholly unconscious by day, while by night the stupor was interrupted by outbreaks of delirium, and attempts to get out of bed. This restlessness at night increased, so that he was given 10 minims of Battley's solution of opium on the 6th of October, and on subsequent nights this dose was repeated, two doses being sometimes needed during one night. He became unable to put out his tongue, which grew dry and shrivelled; he lay always with his mouth open. About the end of the fourth week of his illness several suppurating sores came, without any apparent cause, on his body and thighs, and purulent discharge came from both ears in considerable amount; he was so dull and stupefied we could not tell if he were deaf or not. He sometimes passed water into the bed. There was great twitching

and trembling of his arms and legs. It was not easy to make him take food; still about three pints of milk were given every day.

These bad symptoms made us think he was going to die, but about the end of the fifth week of his illness he grew rather better; his abdomen became softer and less swollen, and his mind became less dull. However, a new symptom appeared on October 16th—the forty-first day of illness: a black patch, about the size of a sixpence, was noticed inside his right cheek, about half an inch back from the angle of his lips, and considerable hardness was felt deep in the tissues of the cheek. The black spot did not seem to extend deeply into the tissues, but it was firmly fixed in its place. Next day both it and the hardness had considerably extended, and on the following day a small black patch appeared on the inside of the left cheek, opposite the second upper molar tooth; this spot was not accompanied by hardness in the tissues around. The stench from his breath now was indescribable and sickening in an extreme degree; he, however, seemed to suffer no inconvenience either from this or from the sore in his mouth. His pulse was very weak, and difficult to count, running up to 160 per minute. Believing him far too ill to allow of any surgical interference with the cancrum, I thought the best treatment was to use local antiseptics; accordingly his mouth was frequently washed out with weak creolin lotion; five per cent. creolin lotion was dropped on the slough; and three or four times a day a few drops of eucalyptus oil were dropped on the slough by means of the ink-filler of a stylographic pen.

I had been hesitating to give him large quantities of food, fearing the typhoid fever, which did not seem to have come to an end; however, on October 20th—the forty-fifth day—it appeared that the only chance of saving the boy's life was to give him as much nourishment and stimulants as he could swallow, so I added to his three pints of milk the yolks of six eggs, three-quarters of a pint of muriatic beef juice, and twelve ounces of whisky—half an ounce every hour, night and day.

Next day—the forty-sixth—the slough on the left side came away; it was superficial, and the resulting ulcer soon healed. The slough on the right side, however, increased in size; it extended all over the inner surface of the cheek, to within one-quarter of an inch from the lips, and the surrounding hardness grew greater. There was no distinct line of demarcation, there being no attempt

at separation between the dead and black slough and the living tissues around.

All this time the outside of his cheek was healthy. On the forty-eighth day a discoloured spot was seen about an inch from the angle of the lips. The discoloration spread. On the fiftieth day a black slough of the size of a shilling was seen in the skin. However, the general condition seemed a shade better.

The changes that now occurred surprised me by their rapidity. On the fifty-first day the slough had ceased to spread, and was beginning to loosen; next day it was nearly free, and on the fifty-third day I lifted out the whole slough with a dressing forceps, leaving a perfectly clean surface.

The destruction that had taken place was very considerable. There was a round hole through the cheek of the size of a shilling, about an inch behind the angle of the lips; on the inner surface, the loss of tissue extends close to the lips and backwards some distance along the outer and inner surface of the masseter, the anterior edge of the muscle standing out into the cavity. Above and below it extended to the junction of the cheek and gums, the latter not being affected.

When the slough came away the stench ceased, and in a few days the boy improved wonderfully, the temperature (which had varied from 101° to 104° F.) falling to normal, and his pulse growing stronger and less frequent. Diarrhœa ceased, and the stupor passed away. His lungs and kidneys remained healthy throughout. For some time longer, however, he was delirious by night, though quite quiet by day. I lessened and then stopped the whisky as soon as I could, and gave him solid food. After a fortnight's improvement he had some kind of a feverish attack, lasting nearly ten days; but with this exception he made a steady recovery.

The hole in his cheek, left by the slough coming away, I expected would lessen in size to some extent, but I thought it would be needful to do a plastic operation to close it. At first it gave him very great inconvenience, for his food used to come out through it when he was eating, but gradually it grew smaller, and after six weeks closed completely. The inside of the cheek, too, healed up gradually. To avoid cicatricial contraction, I have made him hold every day between his teeth a piece of wood as large as he could possibly take in. Up to the present (six months after his recovery) there has been no trouble. He looks in perfect health, and there is hardly any deformity in his face.

The following points specially struck me in this case:—

1. The rapidity with which the slough separated and came away. On October 23rd there was a faint discoloration—a kind of bluish-black colour—under the skin; on the 25th there was a black slough of the size of a shilling; on the 28th it was quite loose and was lifted away.

2. As to treatment, that recommended is singularly uniform—caustic or destructive agencies of some kind or other. If any treatment of this kind be adopted, I am convinced it should be thorough, and should aim at destroying the seemingly healthy tissue for some distance round the slough. Nitric acid cannot destroy this zone, which we know to be invaded by micro-organisms. If any operative treatment be adopted, I think it should be either excision or free scraping, or a combination of these. Sir J. Lister, in a recent case, first removed the diseased area, and a considerable portion of healthy tissue round it. He then removed with scissors every portion that looked suspicious. Then he applied a Volkmann's spoon vigorously. Then pure carbolic acid was rubbed in, and the whitened area again scraped away; a strong solution of corrosive sublimate was applied, and an antiseptic dressing put on. The child recovered, but naturally a plastic operation had to be done on account of the deformity.

My boy did not seem fit for any such proceedings, and did very well without them.

3. As to the use of alcohol—Being almost in despair about him, I gave him a much larger amount of whisky than I am in the habit of allowing, and I am convinced it did him a very great deal of good. The boy was fourteen years old, and for ten days took half an ounce of whisky every hour, night and day—in all, six pints. At the end of that time it was lessened in amount, and finally stopped. There was never any trace of intoxication.

4. As regards the stench—I think the pure eucalyptus oil dropped on the slough was the most successful agent in overcoming the stench.

Dr. Pollock mentioned a case of typhoid in which he had seen inflammation and sloughing of an entire sub-maxillary gland.

Dr. J. W. Moore said that during 13 years' experience as visiting physician at Cork-street Fever Hospital he had seen only four cases of cancrum oris—two following measles and two following typhus. Murchison, in an experience of 5,800 cases of typhoid fever, had seen it occur in it only once. Dr. Moore recommended that the mouth should be rendered as aseptic as possible and kept so. The teeth might be cleansed with a paste composed of eucalyptus oil, liquefied carbolic acid, and precipitated chalk, and the mouth might then be rinsed out with an antiseptic fluid.

Dr. Doyle said he had treated two cases of cancrum oris last year. He did not know whether they were recovering from fever, but he found them on admission to hospital with very decayed teeth. These he extracted and applied to the gangrenous surface in one of the cases hydrochloric acid and in the other nitric acid. The subsequent treatment consisted in cleansing the mouth with a large throat brush and spraying the cavity of the mouth. He also sprayed the interior of the nose and the back of the throat. As medicine he gave small doses of tr. opii and found them very beneficial.

Dr. Finny said he had only seen the teeth and gums affected by extension from the cheek, He pointed out that the disease always began in the cheek opposite the first molar tooth.

Dr. Boyd narrated an account of the treatment pursued in one of the children's hospitals in New York, where an epidemic of cancrum oris broke out. There were 40 cases, and the mortality was only 4 or 5. Subnitrate of bismuth was applied locally. He remarked that the disease had become much less frequent since mercury had been less freely used. He thought that the extensive ulceration in the bowel in typhoid fever allowed of the absorption of the poisonous products of bacteria present in the contents of the intestines. This might have something to do with the extensive suppuration which occurred in Dr. Bewley's case.

Dr. Little drew attention to the benefit resulting from the

administration of stimulants in this case. He considered that the whole question of stimulants required revision. In some cases patients get well in which they are freely given, but they would have done better without them, while in others they would have died if they had not got them. He had seen alcohol do good in cases of pyæmia and septicæmia.

Dr. Dawson mentioned a case of a boy of six years recovering from measles, who was well nourished, but was attacked with cancrum oris first in the left cheek and then in the right. The greater part of his left cheek was destroyed, and a portion of the alveolar process of the jaw exposed. His right cheek was perforated with a hole of about the size of a sixpence. The child recovered; the hole in his right cheek was obliterated; and the opening in the left cheek was much diminished without any operative interference. To allay the foul odour dilute sulphurous acid was sprayed into the mouth.

Dr. Davis suggested that the opening of the parotid duct being situated near the position at which the ulcerations usually occurred, it was possible that it might afford a nidus for micro-organisms.

The President said that the local complications occurring in the mouth in acute fever were of three sorts:—1. Severe ulceration. 2. Acute periostitis. 3. The gangrenous inflammation styled "cancrum oris." Dr. Bewley's case was interesting in that it attacked an older patient than is usual, and that the disease occurred after typhoid fever. In favour of there being a specific cause for the disease we have—(1) its rarity, (2) the definite symptoms and signs, and (3) the constancy of the appearances presented. The foul smell is not a constant factor. In a case lately treated in Sir P. Dun's Hospital there was absolutely no odour. It is a matter of note the quantity of stimulants taken by this boy in a short time. Alcohol, as it is oxidised into carbonic acid and water, is capable of being a source of energy to the body and thus a good—using this word in its widest sense. When more than a certain quantity is taken, part of it circulates unchanged in the body and is excreted as such. To this portion present in the tissues as alcohol might be referred—(1) its antipyretic properties, (2) its antiseptic properties, and (3) its action on the leucocytes.

Dr. Bewley, in reply, stated that this boy had a very considerable quantity of opium throughout his whole illness. His teeth were not at all affected. He could give no reason why the disease

began opposite the first molar tooth. He thought the opening of the parotid duct had nothing to do with it, because in his case the duct was not opened, and no salivary fistula resulted. As regards the stench, it came from the dead slough, and when it was removed the stench ceased.

TETANY.

By ALFRED R. PARSONS, M.B., B.Ch.;
Late Assistant Physician, Sir Patrick Dun's Hospital;
Physician to the City of Dublin Hospital.

[Read in the Section of Medicine, Friday, April 6, 1894.]

Tetany—a disease characterised by a peculiar spasmodic contraction of some of the muscles of the extremities—has a remarkable geographical distribution. Originally described by Steinheim in Germany and Dance in France some sixty years ago, the majority of the recorded cases seem to have occurred in those countries. In South Germany and the German-speaking portion of Austria, especially in Vienna, the disease is by no means uncommon. In the interval between 1880 and 1889 some 360 cases were admitted to the General Hospital of the Austrian capital. This number is just 0·7 per cent. of all the nervous cases admitted during that period. In Heidelberg several cases have been observed and recorded by Erb. On the contrary, in North Germany the disease is exceedingly rare; and among the nervous cases admitted to the hospitals of Berlin tetany was present in the proportion of 1 per 1,000, or 0·1 per cent. Writing of Leipzig, Strümpell describes it as one of the rarest nervous disorders. Up to 1889, according to Stewart, only 6 cases had been recorded in America. Coming nearer home, isolated cases have been described in England and Scotland since Moxon reported one which occurred in Guy's Hospital in 1869; but even Dr. Gowers, who has a very extensive experience of nervous disorders, had, up to 1888, personally observed only 8 cases. In Ireland, the disease would appear to be still rarer, as, so far as time and opportunity have permitted me, I have been able to find no recorded case. It

has, however, been occasionally observed, as Dr. Craig has been good enough to tell me that he has seen one or two cases at the Children's Hospital, and Dr. Purser kindly informed me that he has met with it on a few occasions in young women.

While no age is exempt from tetany, there are certain periods especially prone to it. In young children, according to Erb, the maximum number of cases occurs from the fourth to the sixth year. Next to this period, the disease is most frequently met with in young adults, from sixteen to thirty years of age. It is so common, comparatively speaking, in parts of France among nursing women that Trousseau once described it as the "rheumatic contracture of nurses." A large proportion of the cases in Vienna occur each spring amongst shoemakers' apprentices, hence it is often spoken of as "Schuhenkramf." In fact, the outbreak is so regular that the late Professor Kahler looked upon it as an epidemic disease, most probably of bacterial origin.

The immediate exciting cause is generally undiscoverable, but, especially in young children, severe diarrhœa is not an uncommon antecedent. The typical spasm occasionally follows some of the acute infective diseases, and is stated to occur as a sequel to complete excision of the thyroid, but is not found when one-fifth of the gland is left behind.

The case of this disease which I would wish to lay before the Academy to-night occurred in a pupil of one of the public schools of this city with which I am connected as visiting physician.

The clinical notes are as follows:—

A. B., aged fourteen years, has enjoyed fairly good health for some years past. Owing to the death of both his parents from phthisis no distinct history of his childhood is obtainable. He is well-developed, but is rather dull and stupid. Since coming to the school, however, he has improved mentally and physically; and,

though of a retiring and unsociable disposition, now manifests more interest than formerly in school games. He states that for some three or four years past he has had attacks of pins and needles, tingling and numbness in his forearms and hands. These attacks have sometimes been very frequent, occurring every two hours, though lasting only twenty seconds. They have not till quite recently been followed by any muscular spasm.

In the forenoon of the 1st of March he seemed in his usual health, and in company with the other boys went to the football field, which is about one mile from the school. While walking about in the field he was suddenly seized with a severe attack of tingling, followed by spasms in the upper and lower extremities. The cramps in the latter were so severe that he was unable to stand. He lay down on the grass for a few minutes, and the attack having subsided he obtained permission to go home, accompanied by another boy, but had only covered part of the distance when the cramps again set in, and the journey had to be completed in a cab. On reaching the school the Principal, fearing that it might be an attack of epilepsy, sent for Dr. Craig, who resides in the neighbourhood. Dr. Craig, in addition to several other particulars, noticed that the lower extremities were rigidly extended—the feet also extended and inverted. I saw the patient half an hour later. His face was then flushed and his eyes closed. On being asked to open the latter he did so, slowly and incompletely, but no actual spasm of the orbicular muscle was noticed. A request to show the tongue was responded to by partially protruding it through an imperfectly opened mouth. The tongue was coated; the bowels had not moved since the previous day.

An examination of the thorax disclosed a marked dilatation of the cutaneous capillaries. The skin was flushed, and he was perspiring profusely. The lungs and heart presented nothing abnormal, except that the action of the latter was very frequent, the pulse being 120 per minute. The frequency of the respirations was also somewhat greater than normal, but no spasm of any of the respiratory muscles was noticed. The axillary temperature was 99° F.

The abdomen was likewise examined, with negative results, except that the bladder was full, reaching almost up to the umbilicus, but there was no difficulty in passing urine.

The most striking phenomena were noticed in his extremities. The arms were flexed at the elbow almost to a right angle; the

wrists were also flexed; the thumb was flexed and adducted across the palm; the fingers were flexed at the metacarpo-phalangeal joints, but extended at the others. He was quite unable to straighten his hands; and although the spasm could be overcome by a little steady pressure, and the hand extended, to do so increased the pain, which was most marked about the wrists. Pressure along the inner margin of the biceps for about one minute did not on this occasion increase either the spasm or the pain.

The lower extremities were extended, the foot pointed, the toes flexed, but I did not notice any inversion of the feet. The spasm was distinctly less than when Dr. Craig saw him, and the patient was now able to walk, though with some difficulty, owing to the stiffness of his feet. The right knee jerk was normal, the left was not examined. In addition to the bromides which Dr. Craig had ordered I prescribed a few grains of calomel.

The medicine acted freely during the night, and the following morning he was distinctly better. The spasm and tingling in the lower extremities had almost vanished; his pulse had fallen to 96, though his temperature had risen to 99·8°. He was kept in bed, and the next day I found his temperature normal. The spasm was now almost gone from his upper extremities, but it could be reproduced by pressure over the brachial artery. After thirty-five or forty seconds the patient complained of a prickling sensation in his hands and wrists, and attempted to withdraw his arms. If the pressure were maintained for fifteen or twenty seconds more the spasm came on, and the position taken by the fingers was generally as above described. As Trousseau was the first to point out this remarkable condition it is generally spoken of as Trousseau's phenomenon. It can be excited by pressure on the artery or nerve trunks; and Kussmaul has observed in one case that pressure over the veins was ineffective, while pressure on the artery succeeded. It is more difficult to elicit this phenomenon in the lower extremities by pressing on the femoral artery or sciatic nerve, and I did not try it in this case. On the fifth and sixth days after the onset, though he was apparently quite well and the spasm absent, it could be excited in the upper extremities by pressure. I lost sight of the patient for the next fortnight, after which he went to the country for the Easter vacation. On the day after he left town, greatly to the astonishment and alarm of his relatives, he got another attack, but the spasm lasted only half an hour. Since his return to school I again examined him, but failed to produce any-

thing more than mere tingling in the arm, though I maintained the pressure for about two minutes.

In many cases of this disease the Schultze-Chvostek phenomenon—*i.e.*, great irritability of the nerves to mechanical stimulation—is present. This is generally best marked in the facial nerve, and I have seen some cases in Vienna in which tapping over a branch of this nerve produced a spasmodic contraction in the nerves supplied by it. Tapping and friction were tried in this case, but with negative results. Erb has pointed out that there is in some cases an increase in the irritability of the nerves to electrical stimulation and also an alteration in the mode of response to the continuous current, so that the earliest contraction is obtained by closing the circuit with the positive pole rather than with the negative. No electrical examination was made in this case.

The diagnosis was, I would submit, clear. The case was manifestly not one of tetanus, and differed from hysteria in its bilateral character and peculiar distribution. The boy, furthermore, had never seen any person in a similar condition.

Our knowledge of this morbid state is in inverse proportion to its nomenclature. It has been described under, at least, nine or ten different names—such as intermittent tetanus, spasmodic muscular retractions, idiopathic muscular spasm, brachiotony, rheumaticus, &c.—but the name by which it is most commonly known is that of tetany, given to it by Corvisart. The nature and situation of the lesion are doubtful. From the bilateral character of the symptoms it would seem probable that the *locus morbi* is central rather than peripheral; and as a few cases have been followed by atrophy of the muscles there may be some alteration in the ganglionic nerve-cells in the anterior cornua of the spinal cord, on which the nutrition of the muscle fibre depends. Such a lesion, however, would not explain the peculiar sensory phenomena.

So long as the nature and cause of the disease are so obscure, our treatment can only be empirical. The drugs which are in the greatest request at present are arsenic and the pharmacopœial bromides. Fortunately, the prognosis is on the whole good, death being very rarely caused by tetany, though in some cases a fatal termination has occurred from spasm of the diaphragm or general exhaustion.

Dr. Burgess mentioned a case presenting symptoms somewhat similar to those of Dr. Parson's case. In it, however, the convulsions were more general. The patient, in the absence of the doctor who attended him, was treated by another practitioner, who, taking a different view of the case, gave him a dose of turpentine and castor oil. He passed a large tapeworm and got quite well.

Dr. Dawson said that cases of tetany occurred most frequently in shoemakers and next so in tailors. It did not occur among female shoemakers. It was also liable to occur in women at the fifth month of pregnancy if this coincided with the season of the year at which it was prevalent. Sometimes it was associated with epilepsy and sometimes with cataract. The latter was supposed to indicate a very severe attack of the disease.

Dr. Parsons briefly replied.

SECTION OF SURGERY.

REMOVAL OF TUMOUR OF BRAIN.

By F. ALCOCK NIXON;
Surgeon to Mercer's Hospital;
Professor of Surgical Anatomy, Royal College of Surgeons.

[Read in the Section of Surgery, November 10, 1893.]

THE difficulties of localising and removing neoplasms situated within the cranial cavity are such, I think, as to warrant me in occupying some of the time of the Academy with notes of the following case. I think, too, that all cases of brain surgery, possessing, as they do, much interest for the surgeon, should in the present state of our knowledge of it be recorded.

In the early part of the year 1891 I exhibited here the portions of the bone and tumour which I removed in this case, and I then invited members of the Academy to come and examine the patient for themselves. Some had seen and noted his condition prior to the operation, and many visited him subsequently, so that the facts in connection with the case are within the knowledge of several gentlemen now present.

CASE.—R. M'R., aged 28, on the 10th August, 1891, presented himself for treatment at Mercer's Hospital, suffering from a sebaceous cyst situated over the right parietal eminence, and which had suppurated. This was laid open, and at the bottom of it was found a portion of bone devoid of periosteum. On the 28th of the following September the man left hospital before the wound was fully healed. He lived in one of the northern suburbs and walked into town to his work. On his way he frequently lost himself in the city, forgetting where he was to go. He was a plumber by

trade, and noticed that when driving a nail he often missed it and struck his hand or fingers. In the latter end of the year 1891 he again presented himself, complaining of giddiness, impaired vision, and defective memory. He had then also some slowness of speech.

On the 9th January, 1892, he was again admitted to hospital complaining of severe pain in the head running round the forehead and down the back of the neck. This pain was occasionally intermittent with paroxysmal exacerbations so severe as to cause him to scream loudly during both day and night. The pain was increased by coughing.

On the 12th January, 1892, it was noticed that he was manifesting convulsive movements of the left leg and toes. There was flexion of the hip and ankle with extension of the knee. The movements were at first limited and vague, coming on in paroxysms and lasting short periods. Muscular movements subsequently commenced in the arm. There was flexion of the forearm and fingers, with supination of the hand. Sensation was impaired, especially in the extremity of the lower limb. If the affected hand was moved actively or passively the patient was unconscious of the position in which it rested. Two days later obvious muscular weakness was noticed in the left leg and arm, with slight subsidence of the convulsive phenomena. Reflexes at first were exaggerated, knee-jerk and ankle clonus being readily developed. Paralysis of the leg subsequently became complete, and though voluntary movement of the arm was abolished, the muscles continued in a state of tonic rigidity. There was no loss of power over the bladder and rectum. Retraction of the head and neck, rigidity of the spinal muscles, and photophobia were well marked; the pupils were irregular and sluggish. There was a history of syphilis of old standing for which he was treated with ʒi doses of iodide of potassium and mercurial inunctions, but without effect upon the head symptoms. There was no evidence of kidney disease or lead poisoning, nor was the patient in a marked degree anæmic.

The symptoms when grouped pointed to combined compression and irritation of the brain, and the fact that they had developed with considerable rapidity, and that there had been antecedent suppuration of the scalp, with exposure of the bone, led to the diagnosis of intra-cranial suppuration.

Compression of the brain having been diagnosed, the next step was to ascertain the seat of it.

The fact that the muscular spasms, beginning in the leg, after-

wards involved the arm, and that the paralysis was at a later stage more marked in the leg than in the arm, pointed to the leg centre as being the seat of the primary lesion.

This opinion was strengthened by the fact that there was no aphasia, no mind blindness, and no implication of any of the cranial nerves.

After careful deliberation and analysis of these symptoms the diagnosis arrived at was that the seat of the lesion was primarily in the motor centre of the lower extremity, and that the arm phenomena were due to extension of the disease, or to radiation of the irritation.

It was accordingly resolved to open the cranial cavity at a point corresponding to the anterior extremity of the superior parietal lobule just behind the upper extremity of the fissure of Rolando.

On Sunday morning, 17th January, the patient was semi-unconscious; if spoken to loudly he answered slowly and took a considerable time to put out his tongue. When the operation was proposed, however, his friends refused consent on the ground that he was dying, and that interference would be useless.

Mr. J. B. Story, consulting ophthalmic surgeon, had been sent for, and finding the visual centre implicated, double optic neuritis, and well-marked left hemianopsia, concurred in the diagnosis, and joined in urging operative interference as giving the patient the only chance of life. His relations were, however, unable to make up their minds during the day, and it was not until ten o'clock at night that they ultimately consented.

In addition to my colleagues, Mr. Ward and Dr. Auchinleck, I sought the advice and co-operation of Mr. Wheeler and Mr. Myles, surgeons of well-known skill and eminence, upon whose judgment and courage I felt that I could implicitly rely. To them, as well as to Mr. Story and the other gentlemen who kindly came with him at this unseasonable hour in harsh inclement weather, I shall always feel deeply grateful.

The symptoms which the patient exhibited in the morning were now still more pronounced, and it was manifest to all who saw him that unless some relief was promptly afforded him he must die rapidly.

The leg centre having been mapped out by careful measurements, a V-shaped incision was made directly over it, and a small trephine was applied. The bone was found to be extremely thick, without diploe, and of almost ivory hardness, so that a consider-

able time was occupied in opening the cranial cavity. On removing the small disc of bone, instead of an abscess a hard cartilaginous substance was struck, dipping deeply into the brain and running forward across the fissure of Rolando. A larger trephine was applied, and the diseased mass further exposed and removed. A portion of it ran inwards towards the falx cerebri, and was closely attached to the outer wall of the superior longitudinal sinus, from which it was necessary to remove it piecemeal by means of a Volkmann's scoop.

The neoplasm, *in situ*, measured 2 inches antero-posteriorly by 1½ inches transversely. It was half an inch in thickness. Its upper surface was flat; I exhibited it here in its recent state. The opinion formed by those who saw it so far as they could judge from its macroscopic appearance was, that it was of syphilitic origin, and that it was associated with pachymeningitis.

It was, I regret to say, mislaid in the museum, so that I am unable to submit sections of it to-night as I intended.

Directly the pressure was removed from the brain a marked improvement was noticed in the pulse. When the effects of the anæsthetic passed off the patient was found to be quite conscious and free from pain in the head, which had previously been so intense.

On the following morning his temperature was normal, and his pulse 110. He recognised and spoke to his friends. He was able to move his arm and leg slightly. He noticed that there were spots of blood on my shirt sleeves. He asked me why I had changed my shirt studs, and observed that they were now black. I noted his remarks as indicating a considerable amount of mental activity, in marked contrast to his condition on the previous day.

It would be unprofitable and unjustifiable on my part to trespass further upon the time of the Section by a day-to-day report of the case. It is sufficient to say that the most prominent symptoms noted were severe spasms of the muscles of the arm and leg (reported by the nurses as "rigors"), and which were, no doubt, produced by irritation of the motor area, caused by the separation of the deep attachments of the tumour; retention of urine, which passed off after two days; pain referred to the region of the umbilicus, with diarrhœa; hiccough on the 22nd, and slight delirium, with loss of control over the rectum on the 23rd; subsidence of these symptoms, with the development of a hernia cerebri.

Report on January 29th.—Patient quite conscious; free from

pain in head and neck; can see hands of a watch and tell the time by it; has moved both arms and legs; has recovered power over bladder and rectum; temperature normal.

Mr. Story subsequently visited the patient, but seeing him so well, and, believing that he would soon be able to be up and about, he deferred any detailed examination of him on that occasion.

February 20th.—More than a month after the operation. His condition is noted as follows:—He is quite conscious; is able to sing and repeat the verses of a song; recognises old patients, and can tell what they are suffering from, and also what was done for them when he was in hospital more than a year ago. He has frequently drawn up his left leg, but objects to his left arm being moved, as he says it gives him pain.

February 22nd.—Early this morning the acting resident surgeon was summoned, and found the patient suffering from venous hæmorrhage from a small point on the surface of the hernia cerebri. He removed the dressings and applied Ruspini's styptic to the bleeding point, and reapplied them. When I saw the patient some hours afterwards he was comatose, and died at 11 a.m.

The friends refused permission for a *post-mortem* examination, so that I am unable to say what was the exact cause of death.

Of the various methods devised to enable the surgeon to map out on the surface of the shaven scalp the important parts within the cranial cavity (such as leg and arm centres) which he desires to reach with safety and accuracy, there are three to which I will allude as bearing more directly upon the case under consideration. They are those of Professors Reid, Thane, and Fraser, and in so doing I may say that I am not unmindful of the sterling work of Professors Cunningham and Birmingham in this direction, which is in every respect worthy of the high reputation which these gentlemen enjoy as scientific anatomists.

Professor Thane's Method.—To find the upper extremity of the fissure of Rolando, the following plan is laid down:—Measure along the middle line from the root of the nose to the occipital protuberance, half an inch behind the centre of

this line is the upper extremity of the fissure. This fissure makes with the middle line an angle of 67°.

Professor Reid's Rules.—A base line is drawn from the lower margin of the orbit through the middle of the auditory meatus. One perpendicular from the base line is carried up through the depression in front of the auditory meatus, and a second from the posterior border of the mastoid process to the sagittal suture. The fissure of Rolando is the diagonal of the upper half of the parallelogram running from above and behind downwards and forwards.

Professor Fraser's Method.—The principle underlying Professor Fraser's method may be briefly described as follows:—First, a standard skull is taken. This standard skull has been obtained by most careful measurements and observations of a great number of subjects, carried out by Professor Fraser with an amount of care, patience, and technical skill which do him infinite credit. On this standard skull tapes are laid in various positions. For simplicity of description only three of these tapes may be considered. The first passes horizontally round the cranium from the glabellum in front to the highest point of the occipital bone behind (the maximum occipital point, or point of maximum convexity), which Prof. Fraser found to be invariably one inch exactly above the occipital protuberance, which can be readily felt in all skulls. The second passes over the vertex from the glabellum in front to the same point behind. The third passes from the middle of the horizontal tape directly over the vertex to a corresponding point on the opposite side. These tapes are divided into inches or centimetres. A standard adult skull will show the following measurements:—The horizontal tape measures, say, 20 inches, the antero-posterior, or what may be called the sagittal tape, 12 inches, and the tape passing transversely, and what may be styled the coronal, measures 11 inches.

Looking at Professor Fraser's photographs, it will be seen that the upper end of the fissure of Rolando corresponds to Figure 7 on the sagittal tape. A similar tape is now laid on the skull to be operated upon, and let us for the purpose of illustration assume that from the glabellum to the highest point of the occipital bone (the maximum occipital point) is 10 inches, as contrasted with 12 inches in the standard skull. A simple sum in proportion now gives us the position of the fissure of Rolando on the exterior of the skull to be operated upon. Thus as 12 : 10 : : 7. The result being $5\frac{11}{12}$ths, or, to put it practically, the upper end of the fissure of Rolando in a skull measuring 10 inches on the sagittal tape would be found at a point less than 6 inches from the glabellum. The lower end of the fissure of Rolando corresponds to a point just in front of the dot marking $3\frac{1}{2}$ inches on the coronal tape, which measures on the standard skull 5 inches; on the skull to be operated on let us assume that the distance instead of being 5 is $4\frac{1}{2}$ inches. The position of the lower end of this fissure can be obtained by a similar sum in proportion—as 5 : $4\frac{1}{2}$: : 3 : $\times$ the point to be operated upon, which would be $3\frac{3}{10}$. For accuracy of measurement I think it would be advisable to adopt the metric system.

I have dealt with only three tapes as illustrations, but it is obvious that further confirmation of these details of localisation can be obtained by utilising the other tapes which Professor Fraser has shown in his standard work. The basis of Professor Frazer's system is that the position of the fissures is relatively constant. By this method every fissure and every convolution can be accurately located on the surface of the skull, and reliable calculations can be made as to the position of the deeper lying central ganglia and other important anatomical details.

Of all the methods suggested in connection with cerebral topography I am clearly of opinion that Professor Fraser's

is by far the most reliable and comprehensive, and of greater practical utility to the surgeon than any of the others.

Mr. Thornley Stoker inquired whether it was a lesion connected with the dura mater, or whether it was intra-dural; also whether there was any obliteration of the arachnoid space between the dura mater and the growth in the brain.

Sir W. Stokes inquired whether the sebaceous cyst lay over the situation of the tumour which Mr. Nixon had removed. It was interesting for him to learn that the fibrous envelope of bone was stripped off at the situation of the alleged sebaceous cyst. He remembered, a good many years ago, a very animated debate at the then Surgical Society regarding cysts on the scalp. One of the points then discussed was the erosive effect of these cysts on the periosteum. He would be glad to know whether this was really a sebaceous cyst, or whether there was any connection between it and the tumour which was removed.

Mr. Wheeler said that, owing to Mr. Nixon's careful diagnosis, there was no difficulty in coming to the situation of the lesion. The operation was one of great difficulty and required a great deal of care in the removal of the tumour. The latter was very adherent, very large, and dipped down deeply into the structure of the brain. The operation was performed most dexterously, and everything looked most satisfactory after it. It was unfortunate that there was no autopsy held to show where the hæmorrhage came from, but there was no reason to believe that there was any vessel injured at the time of the operation.

Mr. M'Ardle thought that the history of hernia cerebri was not possibly as well understood as it should be, and in searching out for the cause of death he wished to point out that septic infection would produce death about the time that Mr. Nixon's patient succumbed. He would like to know as to the character of the hæmorrhage, which would aid them as to the cause of death; and, second, the character of the protruded portion of the brain immediately preceding death. He said absolute alcohol had the power of keeping the brain aseptic, and at the same time of causing the greatest amount of pressure to be applied to it—greater than they could apply with safety by any dressing.

Mr. Myles said it was an entirely chronic inflammatory thicken-

ing of the dura mater. He thought this case illustrated graphically the great progress of brain surgery. The different methods of location of the skull contents were very interesting, but Professor Fraser's appeared to him to be the most accurate and complete. By using his charts there would be no difficulty in locating any part of the brain.

Mr. Nixon, in reply to the Vice-President, said there was certainly obliteration of the arachnoid spaces, and the membranes were all matted together. With reference to Sir W. Stokes' question, he had no doubt that it was a sebaceous cyst, and it was seated directly over the seat of the disease. There was a good deal of inflammation of the scalp over the roughened surface of bone, but whether there was any connection between the cyst and the tumour he could not say. In reply to Mr. M'Ardle, he said the hæmorrhage was venous, and it came from a spot on the surface of the hernial protrusion. The latter did not appear to be in a healthy condition, because, when he removed a portion of the hernia, it gave him the appearance of a slough separating. The treatment which he adopted was pressure, as he was not aware then of the good effects of absolute alcohol.

URINARY FISTULÆ AND THEIR TREATMENT; WITH A CASE OF PENETRATING WOUND OF RECTUM PRODUCING PERITONITIS, FOLLOWED BY LAPAROTOMY, RECTO-VESICAL FISTULA, AND RECOVERY.

By T. MYLES, F.R.C.S.,
Surgeon to the Richmond Hospital, Dublin.

[Read in the Section of Surgery, Nov. 10, 1893.]

In bringing forward a subject apparently so threadbare as the Operative Treatment of Urinary Fistulæ, I feel that a few words of apology and justification may as a preliminary measure be offered by me.

I cannot point to the surgery of this subject as one of rapid and encouraging progress, unfortunately for us, while in almost every other branch of our work we can summon as it were witnesses snatched from the jaws of death to testify to our skill and science. In this branch of our duty, in only too many cases, we find that the most painstaking efforts are but too often unrewarded, and that a patient's life is made miserable by a comparatively insignificant-looking ailment.

No one will question the truth of my assertion when I say that the spectacle of a man, otherwise healthy, condemned to endure the miseries of an uncured urinary fistula, is one that is neither creditable to our profession nor to our boasted progress in surgery.

If what I say be true, it is obvious that such a subject is well worthy of our closest attention, and the efforts of even the humblest worker may be offered with advantage to the consideration of such an assembly as I have the honour to address.

I do not intend to attempt to cover the entire area embraced by the term Urinary Fistulæ: I will for the present limit myself to

VESICAL AND URETHRAL FISTULÆ IN THE MALE SUBJECT.

Moreover, I do not intend to weary you with the prolix details of a great number of cases. I prefer to confine myself as far as possible to the enumeration of general principles, and I will only use the details of my cases whenever and wherever they may be necessary for the purposes of illustration. The treatment as given in text-books of the ordinary perineal urinary fistulæ, the consequence of either stricture or injury, may be briefly summarised as follows:—

1. Relief of the stricture either by urethrotomy, electrolysis, wedge dilators, &c., such as Holt's instruments.

2. The prevention of irritation in the fistulous channels by the issuing urine, by means either of a tied-in catheter or by the instrumental evacuation of the bladder at regular intervals.

3. The stimulation of the floor of the fistula by nitrate of silver, actual cautery, or the scoop, &c.

4. The performance of Syme's or Wheelhouse's or other such operations of perineal section.

If we analyse these various methods we find that they can be reduced to *two* great principles, the first of which is to make it easier for the urine to escape through the natural channel than through the fistula, and the second to remove the obstacle to the closing of the fistula which the trickling of the urine over its surface offers.

With reference to the first of these, in the great majority of cases it is, I think, immaterial what method be adopted, provided always that whichever method be adopted it be carried out thoroughly and fearlessly.

Though personally a warm advocate of Maisonneuve's

urethrotome for internal urethrotomy, I am free to confess that, so far as the ultimate cure of the fistula is concerned, equally good results can be obtained with other instruments and by other methods, provided always that the operation performed be a thorough and complete one.

The carrying out efficiently of the second of the two great principles is a more difficult question, and will probably give rise to diverse expressions of opinion from the surgeons present.

The ordinary method used to prevent the infection of the fistulous surface by the issuing urine—namely, to tie in a catheter and keep it there—is open to many and grave objections.

Many of these fistulous patients who have had stricture of the urethra for years are bound to have organic disease of the kidneys, many also have cystitis, others are alcoholic, all are in bad health, and require rest, and above all things, sleep. Keeping a catheter fixed in the urethra for any length of time in such cases is almost certain to produce urinary fever, with the usual rigors and sweating, and possibly suppression of urine. Furthermore, it is a most efficient sleep disturber, and three or four days of it are usually sufficient to reduce even the strongest patient to a condition of debility.

The alternative method of passing a catheter at regular intervals requires that the patient shall have, whether in hospital or in his home, command of skilled surgical assistance, or that he be sufficiently intelligent and skilful to operate on himself. Whichever method is adopted, we shall find that in many cases a little urine manages to escape by the side of the instrument, and that the passage of the instrument tends to stretch and thereby tear the delicate repairing tissue which floors the fistula, or to put it in another way, removes that physiological rest which is such an essential factor in repair.

In thinking over these matters it occurred to me that these difficulties might be met in one of two methods—1st, by making a fresh opening in the perinæum behind the stricture, which fresh opening being cleanly made, without loss of substance, would have no natural tendency to persist, and through which the urine should be allowed for a time to entirely escape while the stricture was operated on, and the sinuses having been thoroughly exposed, scraped and stimulated, it was hoped would heal up rapidly, on the occurrence of which the drainage tube could be removed from the newly-made aperture in the perinæum and the wound allowed to heal. This method I adopted in a fair number of cases with very varying results.

In a few the success was complete and unquestionable; in others the old fistulæ showed no tendency to fill up, notwithstanding the most active stimulation, and again in others I found that I had only performed the equivalent of the financial operation known as "robbing Peter to pay Paul;" in other words, I had cured one fistula, but only by making another.

I state these results with perfect frankness; they have not been such successes as would impel me to take any selfish pride in them; but as some of my younger critics may not feel the same respect for a fistula behind an impassable stricture as I do, I may be permitted to state, for the purpose of showing the gravity of some of these cases, that one of my patients was a man who had been an inmate of every hospital in Dublin for several years—in fact lived on his ailment—and had been operated on by the late Dr. Corley on no fewer than thirteen separate occasions in futile attempts to find the proximal portion of his urethra.

This man was completely cured by a modified form of Mr. Wheelhouse's operation, in which, after I had divided the stricture (found after nearly two hours' search), I carried

the incision very far back and very far forwards. Through the posterior part of the incision a rubber catheter was carried into the bladder and fixed there with a long tube attached, and from the anterior part the sinuses were traced, laid open, and scraped.

Notwithstanding the brilliant success obtained in this particular case, I am not inclined on the whole to press the claims of this method on the notice of other surgeons, as in many of my cases the results were not sufficient to justify the expenditure of time, labour, and skill which such operations demanded. With my mind full of my subject, I was greatly impressed by a suggestion of Mr. William Thomson, the Senior Surgeon to the Richmond Hospital, that relief could be obtained in many of these cases by supra-pubic drainage. I accordingly determined that I would adopt this valuable suggestion on the first favourable opportunity. I had not long to wait before a suitable case presented itself.

Case I.—My patient was a man about fifty-two years of age, with a fistula of many years' standing in the penile portion of his urethra, and another, a smaller one, running through the tissues of the scrotum. The anterior, or larger of these fistulæ, was marked by great loss of substance; it was fully an inch in length, and involved nearly one-third of the entire urethral circumference. Through this the urine escaped; for several years none had escaped through the meatus.

On exploring the urethra I found that he had a tight stricture just in front of the large opening, admitting only a filiform bougie, and further back were several other constrictions of a less severe character.

To enable me to get access to his bladder, which from his other symptoms was evidently the seat of disease also, I performed Maisonneuve's operation for internal urethrotomy, and succeeded in making my way into the bladder. On passing a sound through the urethra after the operation, which had been done without an anæsthetic, to my astonishment I struck an obvious stone in his bladder. My mind was at once made up, and in a few days afterwards I did a supra-pubic cystotomy, removed the calculus, which

I now show, and then carefully sutured the contracted bladder to the edges of the abdominal wound. A large tube was now placed at the bottom of the bladder, carried through the wound, and thence to a basin on the floor. This tube having been filled with lotion, was converted into a syphon by lowering its end into the basin of fluid, and the entrance of air into the bladder was prevented by fixing several layers of gutta-percha tissue to the sides of the tube and the surface of the abdomen. Accuracy of coaptation was effected by partial solution of the tissue by chloroform. The future exit of the urine being thus provided for, I at once set myself to attack the fistula. A large-sized steel staff was passed into the urethra, and I confess that when I saw how much of the urethral circumference was involved in the lost tissue I had but small hope that my operation would be a success. A free incision was now made into the urethra in the middle line, enlarging the aperture by fully an inch and a half, the edges were then carefully pared, and I endeavoured to approximate them. Every attempt to do so was a complete failure, even when I withdrew the staff and replaced it by a No. 4 catheter. In this difficulty it occurred to me that the deficiency might be supplied at the expense of the roof of the urethra, and I accordingly with a sharp tenotome cut deeply into the roof of the canal, not only opposite the fistulous aperture, but as far as I could reach both in front and behind. Sharp bleeding followed this incision, and caused some delay; it was finally arrested by firm pressure.

I now found that the edges easily came together over a No. 8 catheter. The sutures were now passed, the wound well dusted with iodoform both inside and out, and the edges carefully apposed. About five inches of a bougie well covered with iodoform emulsion was then fixed into the urethra to prevent the incision in the roof from becoming adherent by any accident to the wound in the floor. The operation turned out a complete success; the bladder for fully a month was drained over the pubes; the urethral wound healed without any trouble, and cicatricial contraction of the wound in the roof of the canal was held in check by the daily passage of bougies as far as but not further than just behind the scrotum. I do not think I exaggerate when I say that I feel assured that by no other method could such a case have been relieved, and I have no hesitation in expressing my opinion that this valuable suggestion of my colleague, Mr. Thomson, has not received here or elsewhere the attention and trial it deserves.

The last case with which I will trouble you was so remarkable that you will, I think, agree with me in thinking it worthy of notice. The story is briefly this:—

CASE II.—A very powerful young man had been drinking heavily one Saturday afternoon, and in the course of his pleasantries fell on the broken leg of an upturned chair, which entered the rectum, causing great pain, hæmorrhage, and collapse. His friends, who, although undoubtedly sympathetic, were probably equally intoxicated, contented themselves with saying that "he would be all right in the morning," and accordingly left him on the floor till morning. On the following day he was in great pain and distress and was sent into hospital on Monday morning. I saw him soon after admission with my then colleagues, Drs. Cranny and Conway Dwyer, and his condition was then as follows:—

Intense rectal pain and tenesmus, absolute constipation, urgent tympany, vomiting, high temperature, great abdominal tenderness, dry brown tongue, cyanotic face and shallow, hurried respiration. On examining the anus there was not even a scratch to be seen, but on putting my finger into the rectum I could feel a few inches up a large jagged wound on the anterior wall. We at once determined to make a thorough examination under anæsthesia. Chloroform having been administered and a duck-bill speculum passed into the bowel, the wound could easily be seen in its lower part, but its upper end was concealed from view. Fearing the bladder might have been entered, I passed a catheter and injected fluid into the bladder, expecting to see it emerge from the wound in the rectum. The bladder, however, was apparently intact, because it steadily distended without a drop of fluid escaping *per rectum*. A clean catheter was now passed into the wound in the rectum, and apparently travelled a distance of six or seven inches into the abdomen. Feeling certain now that we had to deal with a case of penetrating wound through the rectum causing peritonitis, we at once decided to open the abdomen, leaving the rectal catheter *in situ* as a guide. The abdomen was rapidly opened, and our diagnosis of peritonitis proved correct by the abundant peritoneal lymph that covered all the pelvic viscera, as well as by the large quantity of blood-stained serum that welled up from the cavity.

This having been removed by copious douching, I set to work to find the aperture in the rectum that I believed to exist. My search, however, was in vain: the catheter could be felt by the

side of the rectum, but behind the peritoneum; it was withdrawn again and again, and passed in various directions, but every attempt to find an opening in the peritoneal sac failed. Accordingly, as nothing further could be done, the abdominal wound was closed and a drainage tube inserted in it.

Before sending the patient to bed I thought it safer to make provision for a free outlet of the bowel contents by first nicking the sphincter ani in several places and then stretching it thoroughly. At the same time a large drainage tube was passed up through the wound of the rectum into the pelvis as high as it would go, its lower end being carried outside the anus. The patient was then put to bed. For two days his condition was admirable, but he then drew my attention to the fact that something was wrong with his urinary apparatus. His language on the subject was so remarkable that I may be pardoned for reproducing it. He said that when making water he heard a "noise as if the Fire Brigade was coming along the street." On my asking for a demonstration on the subject, he endeavoured to pass water for me, but succeeded only in evacuating a little fluid, interrupted by explosions of flatus from the urethra, which explosions were the cause of the phenomena which he described with true Celtic hyperbole. I again passed a catheter and injected fluid into the bladder, which now escaped readily through a rectal speculum; in other words, a recto-vesical fistula was present.

What the exact mechanism of its production was I am unable to say: whether the original aperture had been closed by a clot, or whether the opening was the result of a slough, it is impossible to decide. Feeling unwilling to submit my patient again to the knife, I determined to give the bladder an opportunity of contracting, and thus diminishing the size of the opening, by keeping it thoroughly emptied by a syphon arrangement. A soft catheter was passed just to the bladder, a long tube fixed to this by a glass junction, and the lower end fixed in a basin of fluid. The result was a complete success; in a week the bladder wound had closed, and the patient made a perfect recovery, his convalescence being delayed by an abscess in the testicle, probably the result of infection through the vas deferens.

I have described this case at some length because of its unique character and the success which attended a comparatively simple method of treatment.

In conclusion, I may be permitted to express the hope that my paper will initiate a discussion which cannot but be of use to us all, and may direct attention to a subject which, though of everyday occurrence, sometimes baffles the ablest minds and most skilful hands in our profession.

Mr. Edward Hamilton (President) commented on the good results of free incision in treating such difficult cases.

Dr. Brooks said there was one point he did not hear enunciated—that was with regard to the excision of fistula, which was described about six months ago by an American writer. There was one case where a man got a fall from the top of a ladder and ruptured his urethra at the junction of the membranous and bulbous portions. The surgeon cut down on the wound and endeavoured to bring the ruptured ends together, but was unable to find the cystic end. He then made a supra-pubic cystotomy and passed a tube from the bladder into the perineal end of the urethra. The two parts were then sutured together, and the wound healed rapidly. Some time after the same surgeon met with two cases of fistula of long standing, and having excised the diseased portions he brought the healthy portions together, and the results were very satisfactory. He would like to have the opinions of the surgeons present with regard to the treatment.

Mr. M'Ardle said that the value of supra-pubic cystotomy for the purpose of giving physiological rest to the urethra was very great. He had been in the habit of carrying it out himself for the relief of tubercular prostate. With regard to the operation itself, he thought that once they escaped the veins on the post-pubic cellular tissue and brought the edges of the bladder to the skin all the trouble was over. With regard to the tendency to fistula above the pubes, he thought that if the incision is made directly in the middle line closure takes place readily.

Mr. Thomson said he was not prepared to adopt the rather gloomy view which Mr. Myles had taken with regard to urinary fistula in general. His own experience was that the vast majority of those cases where they depend upon ordinary organic stricture are curable. He could only remember two cases which seemed to resist all ordinary treatment. One of them was a case of traumatic stricture, in which the original injury had destroyed a large portion

of the urethra, and that mutilation had been subsequently increased by some six operations which had been performed upon the patient. But as far as the bulk of the cases went he was quite satisfied that the tendency of urinary fistula, perineal or scrotal, was to get well, provided they established a perfectly free channel in the urethra for the discharge of the urine, and supplemented it by perineal section. Of course, a great number of these cases had been neglected for years, and they would find the tissues matted and indurated, and unless they took considerable care their incisions would not heal. In his own cases he always followed out these fistulous tracts to their utmost limits, and dissected out all the hardened tissues. In all these cases it was absolutely necessary to have a free water-track, and he always took care to free the whole urethra by the aid of Maisonneuve's instrument. In one case a fistula had existed for eight years, but after a considerable amount of patience and work the result was entirely satisfactory, and it had now remained closed for more than three years. Mr. Brooks had referred to the question of dividing the urethra and bringing the divided ends together; but he was not sure that there was any necessity for that, because, by adopting the method he (Mr. Thomson) had referred to, they would have a fresh wound in ordinary healthy tissue, and it would heal up very kindly. Then, even if there was any considerable induration about the urethral orifice of the fistula, they could nip it off with scissors; but to take out a considerable portion of the urethra was a rather serious proceeding, and it might later on establish a very uncomfortable stricture. He thought the results of opening the bladder in the supra-pubic region for the cure of obstinate fistula, as he (Mr. Thomson) had suggested, were extremely satisfactory, and the tendency was for the wound in that region to close once the urine had taken its normal track and the perineal opening closed.

Dr. Bennett inquired whether supra-pubic drainage controls the tendency to erection of the penis; because he thought the difficulties of curing a perineal fistula were increased by their inability to control erection. He was aware that perineal drainage did not prevent such phenomena.

Mr. Wheeler said, with reference to Dr. Brooks' remark, he remembered a case which came to him from South Africa. The man had fallen across a beam of timber and got extravasation of urine. Symes' operation was performed on him there, plus division of the scrotum as well, so that when the patient came to

him you could put a testicle on each thigh. He healed all the fistula down to the tuber ischii, and then one remained in the centre of the urethra. He then pared the edges of this fistula, and having passed in a full-sized catheter, pinned the urethra together with small pins and painted the part with collodion. The man made an excellent recovery, and 10 years after could pass a No. 8 catheter. He also remembered a urinary fistula at the umbilicus which, on being touched by the cautery, got well.

Mr. Nixon said Mr. Thomson's practice was a most important one—*i.e.*, not scraping the diseased tissues but their complete removal. He remembered a case of 15 years' standing, where the tissues were so solid as to resemble elephantiasis, and on removing the whole mass with a curved scissors healing was complete.

Mr. Thornley Stoker said that although supra-pubic drainage was probably the best method for draining the bladder, yet it was a method which was not possible in a good many of these cases, because the bladder had become so contracted that the operation of supra-pubic cystotomy was scarcely justifiable. In some of them the bladders were no larger than walnuts, and the apices were often below the lower edge of the symphysis pubis. While he agreed with Mr. M'Ardle as to the simplicity of supra-pubic cystotomy, he could not understand him setting up objections for the sole purpose of knocking them down. He never heard yet that the rectus muscle was an objection to supra-pubic cystotomy, and it would be a disgrace to the surgeon who would cut it.

Mr. Myles said he had no experience of the operation Dr. Brooks inquired about, but he thought it was one of almost stupendous difficulty. To cut down and dissect a little of the penile portion of the urethra was not so very difficult, but in the great majority of cases the contraction was at the membranous portion, and he thought the vitality of the parts was so slight that the mere introduction of sutures was likely to be followed by sloughing. In reply to Dr. Bennett, he said he did notice that the patients suffered from the usual phenomena of turgescence. He thought the cases where it is impossible to bring the bladder forward must be very few, and he reminded Mr. Stoker that in the frozen subject the top of the prostate gland is never below the symphysis pubis.

THE OPERATIVE TREATMENT OF ENLARGED PROSTATE.

By ARTHUR CHANCE, F.R.C.S.;
Surgeon to the Mater Misericordiæ Hospital, Dublin;
Surgeon to the Dublin Orthopædic Hospital.

[Read in the Section of Surgery, December 8, 1893.]

The frequency of obstructive prostatic enlargement, the harassing character of the disease, and the inadequate nature of its palliative treatment will, I hope, justify me in bringing the subject before you to-night. And that I may have a text to act as a base on which to build my remarks, I will read to you brief notes of a case in which I performed prostatectomy with a fair measure of success.

Case.—My patient was a worn-looking farm labourer, aged fifty-six. Save for an occasional cold, the result of exposure, he had had no serious illness, and prior to September, 1891, he had never suffered from any form of genito-urinary disorder. At that time he noticed a gradually increasing difficulty in making water. Micturition became more frequent, the stream weaker, and pain was felt over the pubes. Defæcation was accomplished with much straining, and the motions were flattened.

In February, 1892, these symptoms culminated in an attack of complete retention, and for this condition he was first admitted to the "Mater."

On examining through the rectum the prostate was found to be very large, so much so that it was difficult to pass the finger into the bowel. The growth was of elastic hardness, resembling to the touch solid India-rubber.

After catheterism and other appropriate treatment had been adopted for some days the power of voluntary micturition returned, but the act was still difficult, painful, and very frequent.

With the idea of reducing the hypertrophy I determined to try the effect of electrolysis. I, therefore, had a curved trocar made,

insulated, save for about half an inch at its point. After emptying the bowels, washing out the rectum with an antiseptic solution, and dilating the sphincter, I introduced the point of the trocar well into the prostatic mass. On account of the size and fixity of the growth this procedure was easy; but it was accompanied by free hæmorrhage. Connecting the trocar with the negative pole of a Leclanche battery I completed the current by applying to the inner side of the thigh a large charcoal electrode connected with the positive pole. The current was then permitted to flow for about fifteen minutes when it was for a short time reversed. This procedure was repeated six times at intervals of from seven to fourteen days.

At the conclusion of this treatment the patient could hold water for about an hour at a time. Pain and straining still continued.

I lost sight of my patient for some months, but on the 13th December, 1892, he again appeared in a condition much worse than before. He was worn and haggard looking. The straining had increased although the stream was weaker; the pain was worse, and the intervals between the acts of micturition were only of about ten minutes duration. To use his own graphic phrase—"he hadn't time to warm the bed before he had to get out again," and his distress was so great that "he was praying for a man to come and shoot him." The residual urine was only about two ounces, although the patient thought his bladder nearly full. The water contained neither pus, albumen, nor sugar. Defæcation was still difficult.

On the 24th January, 1893, I proceeded to perform supra-pubic prostatectomy. The bladder was repeatedly washed out with warm boracic solution and was then as far as possible emptied through a catheter. Subsequently a quantity of about fourteen ounces of boracic solution was introduced by means of a syphon from a vessel held about four feet from the operating table. The penis was then ligatured. No rectal bag was used. As I laid my hand on the relaxed parietes I was surprised to find how thoroughly the bladder was brought into contact with the abdominal wall. An incision of about two and a half inches was made and the bladder exposed. It was seized with a sharp hook, incised to the extent of about an inch and a half, and the edges of the incision were secured by ligatures passed through the bladder wall and held at their free ends by an assistant. The inner surface of the

bladder seemed healthy. The prostate projected inwards as a large hard mass, not unlike the cervix uteri. The bladder was considerably depressed below this ingrowth. The opening of the urethra could not be detected until a sound had been introduced. It was then found at the apex of the cone-shaped projection. I found it difficult to use a scissors effectively for removing the growth. Instead I used a flushing scoop connected with an irrigator filled with sterilised hot water. This apparatus I found most satisfactory. Guided by the sound I scooped out a funnel-shaped opening along the track of the urethra. The hæmorrhage was alarming, filling the bladder, and being washed out in large clots by the strong stream of water; but it was stopped rather quickly by flushing with hot water. The prostatic tissue was tough and difficult to excavate. It was washed away in small pieces. I think, all told, I removed about half an ounce of the growth. I then passed my finger well into the prostatic urethra and found no obstruction.

The upper portion of the parietal incision was closely sutured, and the bladder stitched to the abdominal wall. No drainage tube was used.

Briefly, the man had not a bad symptom. He commenced to pass water through the urethra on the twentieth day after operation, and the wound was healed on the forty-second. I showed him at the June meeting of the Academy. He could then hold water for seven hours.

In August he was engaged in building hayricks, and when thrusting up the hay from the ground he slightly strained the abdominal cicatrix. There was no hernia, merely a weak spot. I directed him to wear a suitable truss.

On December 2nd; that is more than ten months after the operation, I again examined him. His health was much improved and he had no pain or trouble of any kind. He could hold water easily for ten or eleven hours, and he assured me that for months he had not found it necessary to micturate during the night. After a long night he found it difficult but not impossible to empty his bladder completely at the first effort. It was easier to partially empty it first and a few minutes later to complete the act. He passes a fair sized stream of less than normal force without straining. Difficulty of defæcation still exists, but is somewhat diminished.

Some points in this case merit comment. The large prostates which give rise to bladder trouble rarely project into the rectum. In this case, as I have mentioned, there was much straining at stool, and there was even some difficulty in introducing the finger. The large size of the prostate and the extent to which it was fixed in the pelvis forbade the use of a rectal bag during the operation; but, as I have said, a bag was not necessary.

The "uniform circular projection surrounding the internal orifice of the urethra," as M'Gill terms the condition found in my case, is not an unusual form of prostatic enlargement. Its frequency has been overlooked from the fact that when at a *post-mortem* examination on such a case the urinary organs are removed from the body, the prostate, losing the support of the surrounding tissues, does not project into the bladder as it did during life.

The influence of this form of enlargement in causing partial retention of urine is ingeniously compared by M'Gill to the action of the mitral valve. In the heart when the ventricle contracts the valve is closed. When the bladder forcibly contracts the intravesical pressure squeezes the valve-like sides of the prostatic projection together so as to more or less completely close the urethra. When the violent effort to urinate ceases the greater part of the water gradually flows away.

It appears to me that the usual method of estimating the amount of residual urine is open to fallacy. Does the passage of a catheter in a patient such as mine completely empty the bladder? The expulsive force of the bladder is usually impaired, but, apart from this, a considerable quantity of the urine, distant from the eye of the catheter, must collect round the projecting prostate. Indeed, the condition of the bladder resembles one of these "button-hole" "non-spilling" ink bottles, from which the ink

cannot be emptied completely, no matter in what position the bottle may be placed.

Possibly this may be the explanation of the small amount of residual urine drawn off from my patient. Except on some such supposition I find it difficult to explain that with only about two ounces of residual urine (as usually estimated) and with no well-marked inflammation, micturition could have been so persistently frequent.

I am inclined to attribute the good result following electricity more to the free hæmorrhage than to any electrolitic action.

Three routes have been suggested for getting at the enlarged prostate—the supra-pubic, the urethral, and the perineal. That the supra-pubic is the most effective is too obvious a proposition to need defence. But without suture of the bladder, and this is impracticable in most cases, supra-pubic prostatectomy is open to two disadvantages—inefficient drainage and a yielding abdominal cicatrix. As regards the first, my opinion is, I know, at variance with that held by many surgeons. But it seems to me that as the patient lies on his back the bladder *overflows* rather than drains through the supra-pubic wound. No doubt, the abdominal viscera compress the bladder so as to minimise its capacity, but a channel must exist between the ureters and the abdominal opening, and this channel running past the retro-pubic space is constantly full of urine. Besides the raw cavity of the prostate cannot but be unfavourably affected by the lodgment of irritating urine.

M'Gill held that supra-pubic drainage was efficient, but in the same paper in which he formulates this view, he mentions three cases of suppuration in the retro-pubic space following supra-pubic cystotomy.

It may be urged that by using a tube the danger of extravasation is minimised, but, as Mr. Treves says, "there is no object in introducing a tube into the bladder, and the various syphon drainage tubes are delusions and snares. . . . No drainage tube will prevent the occasional escape of urine into the connective tissues around the incision."

That the supra-pubic incision alone does not effectively drain the bladder was well demonstrated by a case I had some time since. My patient was a clergyman on whom I performed supra-pubic lithotomy removing four fairly large stones. It follows that the opening in the bladder was of considerable size. My patient had long been a diabetic, and the disease seemed re-kindled by the operation, as for some time afterwards he had intense thirst and passed large quantities of urine; yet, in spite of all this, for the first eight days every drop of urine came by the urethra.

Having regard to the possibility of a yielding cicatrix, I would deprecate the transverse division of any of the structures forming the abdominal wall. The upper end of the parietal wound should, of course, be carefully sutured. I cannot but think that the leaving open for drainage purposes of a part of the abdominal wound must occasionally result in insecure union.

In my case the exertion caused by lifting bundles of hay was the exciting cause of the yielding of the cicatrix; but the straining at stool was probably a contributing factor.

It seems to me that perineal drainage is the best way to avoid both the difficulties of which I have spoken. It would give efficient drainage, and in this way would facilitate the early closure of the abdominal wound. The perineal opening would also permit of the free exploration

of the prostatic urethra and the detection and removal of growths that might not be obvious to the finger introduced from within. In addition the effect of a large tube in moulding the new prostatic path might be of distinct value.

I would advocate, therefore, the introduction through a median perineal incision of a large flanged drainage tube such as is used in empyema, but with no side openings save near the inner end. The urine could be caught by a carbolised sponge as in perineal lithotomy. The use of a tube leading directly from the bladder to a vessel outside the bed is open to the objection that such a tube may be readily obstructed either by kinking or by pressure from without.

Of course a perineal section means some added risk, but I think the advantages to be gained outweigh this. The possible formation of a permanent fistula is another difficulty, but Wishard's operation might be relied on to close this.

Passing to a broader question, has not the time come to advocate the earlier performance of prostatectomy? The obstruction is due to an organised hypertrophy which no palliative treatment will remove. It increases with time and the symptoms it causes are distinctly progressive.

Every day the bladder degenerates and the prospect of success after a radical operation diminishes. Inflammatory changes may occur despite all precautions. Complete retention with subsequent atony may result from but a little indiscretion. And at best is not catheter life a euphemistic name for a peculiarly irksome condition of slavery.

Excluding those whose condition forbids all operative procedure, are we in the remaining cases to adopt palliative measures until they break down, or are we to adopt

prostatectomy at the earliest favourable moment after obstructive prostatic enlargement is with certainty diagnosed? It is to solve this question that I ask your aid.

Mr. Kendal Franks congratulated Mr. Chance on the success attending him in this case. He himself had seen this case in the Mater Hospital. He had the satisfaction of knowing from the patient himself that there was a great improvement in his condition. He thought that this operation was one of the many operations that marked the progress of surgery in the latter part of the nineteenth century. They had all met with a great many cases of prostate enlargement, and what a miserable class of cases they were! They knew that after catheter-life had been established the patient's life was frequently simply unendurable. They accepted with great pleasure the recommendation of Sir H. Thompson for relieving this miserable condition a few years ago. This method of draining the bladder through the perinæum he had tried in several cases, and he saw that it was certainly a most valuable procedure for giving physiological rest to the bladder, and with relief of all symptoms for a time. But in this operation they had a much more valuable method of dealing with it, because they not only gave physiological rest but they also removed the cause of the disease. He entirely agreed with Mr. Chance as to the value of supra-pubic drainage, but he thought where they had a healthy perinæum they should deal with it there, because it was putting the drainage in the most dependent position. Otherwise, the maximum amount of drainage we get is the overflow, and we do not get the bladder completely emptied. He suggested that in these cases of prostatectomy the best thing to do was to make, in addition, a perinæal opening and put in a big tube. In the supra-pubic operation he thought it a very desirable thing in most cases to obtain primary union of the bladder wound, because they would not then have a weak spot in the abdominal walls, and it was the point where the drainage-tube was put in which frequently yielded, and where hernia was most likely to occur. As to the time at which the operation should be done, he thought that in suitable cases the earlier it was done the better. He thought there would be a far larger percentage of successes if they only took the thing

in time. He would be inclined to say that once the catheter required to be passed more frequently than every second or third hour, the limit would be reached at which the operation should be adopted.

Mr. Myles thought that this admirable paper presented a subject of the greatest importance and the greatest difficulty. His own experience was that the diagnosis of these cases was not at all simple. He instanced a case sent from the country as one of prostatic enlargement. The patient had all the ordinary symptoms, as difficulty of micturition, and on examination per rectum the prostate was found enlarged. All the ordinary catheters got stuck at the bladder, but a short-beaked staff entered The patient subsequently died, and his bladder was found to be absolutely normal, so that he thought it was a very difficult matter to know what cases of prostatic enlargement were cases for operation. He said if they examined the specimens in the Museum of the College they would find an extraordinary diversity in the types of prostatic enlargement. He remembered Mr. Tobin reading an excellent paper on this subject two years ago, and he brought down to the meeting several interesting specimens. Some of the specimens were those of a pediculated tumour growing from the posterior part of the prostate, and absolutely excluding the aperture of the urethra. Others presented ragged, irregular enlargements of such a type that operations on the middle lobe would do no good. They could only be simply scraped away or cauterised. Another point of great importance in these cases was the fact that the tenure of life in these patients was extremely limited. He instanced the patient already referred to, who, three hours after the instrument was passed, got a severe rigor, which was repeated, and he died at ten o'clock that night. On examination, all the organs were healthy save the kidneys, which were in a state of hydronephrosis. He said, therefore, that if a man with an enlarged prostate should die after examining the bladder, how much more likely was he to die if he submitted to operation. He next referred to the electrical treatment of Mr. Chance, and said that he himself had used it on his private patients, much to his own and their detriment. He would like to know whether Mr. Chance used the galvanometer, and whether an increase in the force of the current produced a corresponding diminution in the size of the tumour. With regard to supra-pubic drainage, he submitted there were means by which the bladder could be kept quite empty.

He explained how by means of an Indian-rubber apparatus a perfect syphon would be formed by which not a drop of urine would be allowed to collect in the bladder; and the kinks could be avoided also. He thought it a very difficult matter to tap the bladder through the perinæum if the prostate be enlarged. The distance between the perinæum and the floor of the bladder is fully three inches, and it was not every practitioner's fingers that could reach it. He also wished to question the use of the term "residual urine." Were they to understand by that the urine that remains after the patient has exerted all his voluntary efforts, or after the surgeon has evacuated what he can by the catheter. He did not think that the mechanism of the catheter was properly understood, because it was immaterial whether the catheter was placed above the actual level of the fluid or below it, as the fluid would flow in the line of least resistance owing to the pressure inside the abdomen being always positive.

Mr. Chance, in reply to Mr. Franks, said with regard to the closing of the bladder, that the probability of failure would be very much diminished if perinæal drainage were employed, because there would then be no strain on the bladder. With regard to the time of the operation, when there was obstructive prostatic enlargement, he did not see the use of wasting time but would deal with it at once. He admitted with Mr. Myles that the difficulty of diagnosis was great, but he always adopted the precaution of first reducing any inflammation by mild measures, and he thought that after that the age, symptoms, &c., would lead them to a right conclusion. With regard to the different kinds of growth, he said his case was of a most difficult kind, because it was a circular and os-like projection into the bladder, and it gave the maximum of trouble, and he could not understand any more irregular form of growth to be met with. He did not believe in the efficacy of electricity, and when he found no good results he stopped. He joined issue with Mr. Myles about syphon drainage. He thought the idea simply Utopian, although it might have a scientific basis. With regard to discerning between the membranous portion of the urethra and the bladder, they did not want that, because supra-pubic prostatectomy dealt with the prostate, and then by a perinæal incision into the membranous portion of the urethra it would meet the other finger, and a drainage tube could be inserted. Mr. Myles has denied the existence of a post-prostatic pouch, but he (Mr. Chance) thought that applied only to the healthy subject, because, as a

matter of fact, he could put his finger into it in his last case. By residual urine he understood the water drawn off by the catheter after the patient had passed as much as he was able. He said that even after emptying the bladder by the catheter, a considerable quantity still remains behind. His proof was that when they washed out the bladder and passed a catheter, and afterwards injected 14 ounces of water, the bladder was distended to considerably more than it should be by the 14 ounces. He referred to the advantages of the scoop, and said it was especially useful where they had only a small opening.

LAMINECTOMY IN CERTAIN CASES OF SPINAL INJURY, WITH NOTES OF A CASE.

By THOMAS MYLES, M.D., F.R.C.S.;

Surgeon to the Richmond Hospital;
Member of Council and Professor of Pathology, Royal College of Surgeons.

[Read in the Section of Surgery, December 8, 1893.]

The terrible consequences following fractures affecting the spinal column have from the earliest days of surgery stimulated surgeons to make an effort for the relief of these distressing injuries, but it cannot be said that these efforts hitherto have been very successful. So unsuccessful, indeed, in the past had been every attempt to offer surgical relief that until very recently the majority of surgeons, in utter despair of being able to confer any benefit upon their patients, have assumed a position of hopeless despondency and have resigned themselves to seeing their patients either die at once from the effects of these injuries or sink helplessly into a condition of paralysis.

The advances made in brain surgery during the last decade, and the works of Horsley and Macewen, in connection with spinal tumours and constriction of the cord, have again aroused surgeons to the hope that at least in some cases of spinal injuries a justifiable attempt might be made to relieve a condition that, unrelieved, could only terminate in death or paralysis.

As this branch of surgery is as yet in its infancy, every contribution to the general information has an importance attached to it which is quite irrespective of the insignificance of the contributor, and it is on this ground alone I venture

to bring before you to-night not only the notes of one case, but some general observations on a subject of such great interest.

Case.—My patient, J. D., aged sixty-five, a farm labourer, was admitted into the Richmond Hospital on March 25, 1892, suffering from well-marked paraplegia. The history was as follows:—

He had been standing on a donkey-cart loading up potatoes, when from some cause the donkey moved forwards, and he, losing his balance, fell backwards, striking the ground with the back of his head and neck, so that his chin was driven on to his chest with some violence. When his companions went to his assistance they found that he had lost all power in the lower limbs, and at once brought him to the hospital.

On admission he presented all the symptoms of severe shock and collapse; his extremities, however, were warm, his pulse slow and feeble, respirations shallow and hurried, pupils contracted, his mental condition rather dull, but he complained of pain in the neck, increased by movement. On more detailed examination we found that he had completely lost all power of voluntary movement in the lower limbs, his sphincter ani was relaxed, and his bowels had discharged their contents into his clothing; his bladder had lost its power of expulsion. Cutaneous sensibility, however, was present in both lower limbs; in the left lower limb all reflex action was lost, but on the right side he had well-marked ankle clonus and knee-jerk, and on putting the finger into the bowel a vigorous and sustained contraction of the sphincter followed. There was no priapism.

On the following day he was again examined carefully, and we found the following condition present:—Motor parlaysis of both lower limbs, a vivid red blush existed in both inner malleoli, where they had probably been in contact. Knee-jerk, ankle clonus, and plantar reflexes were now absent on both sides; the right leg and the whole of the right side of the body was anæsthetic as high as the nipple; above that sensibility still existed. Along the whole of the right arm, with the exception of the ulnar area, cutaneous sensibility could be demonstrated. On the left side the leg, the abdomen, and the lower part of the thorax were anæsthetic, but above the 8th dorsal nerve distribution sensation was present; the left arm, left shoulder, and left side of neck were normal as to

sensation. He can pronate and supinate the right hand and can flex the right wrist, but cannot flex or extend the fingers.

On the left side, pronation and supination, flexion and extension of both wrists and fingers are lost; pupils are contracted but react to light slightly. Respiration is entirely diaphragmatic, and on every inspiration the lower ribs are powerfully drawn inwards; the intercostal space is depressed and the thorax diminishes in all its diameters except the vertical. On expiration this condition is reversed; the thorax expands, the intercostal depression disappears, and the epigastric bulging subsides. He has now well-marked priapism. When asked to grasp anything in the right hand, he performs a curious evolution; by extending his wrist he makes the flexors tense and so grasps the object, much in the same way as a bird retains its hold on the branch of a tree when asleep.

Having carefully considered the case in consultation with my colleagues, Mr. Thomson and the Vice-President of the College, we determined to give the man whatever small chance an operation could afford.

Chloroform was administered, and an incision made from a little below the occiput to the seventh cervical vertebra; the muscles were cleared and the vertebral arches exposed. It was then found that several of them were shattered and that their fragments pressed on the cord. The loose fragments were first removed and then the arches of the 4th, 5th, and 6th vertebræ were completely detached by cutting forceps, and the dura was exposed. As this seemed tense it was opened and the cord examined. No blood could be seen, and the cord seemed healthy so far as it was visible from the wound. As nothing further could be done, the wound was closed and the patient sent back to bed. For a few hours after the operation he seemed to have got some slight relief, but on the next day he began to sink, and died of dyspnœa on the 28th, three days after the accident.

On making a *post-mortem* examination we found that in addition to the fractures of the vertebral arches already alluded to, there was also present a fracture involving the body of the third cervical vertebra. The cord when examined from the front had the appearance of being slightly bruised, but was by no means in the shattered condition we would have anticipated from the severity of his symptoms. There was very little blood at the seat of fracture, and no displacement of fragments from the body of the vertebra.

I have given the details of this particular case at some length because it is only by careful analysis of the symptoms that we can hope to separate cases that are absolutely hopeless from those that offer a prospect of relief by operation.

I think we may fairly lay it down as an axiom that in all cases where the cord is actually divided or seriously disorganised by crushing, operation is hopeless; and, on the other hand, those cases in which the cord is compressed only, and its structure not actually disorganised to any serious extent, may be operated on with a reasonable hope of improvement, if not of actual recovery. Obviously, therefore, the first problem offered to us is one of accuracy in diagnosis.

Can we distinguish between those cases in which the functions of the cord are merely in abeyance from those in which they are utterly destroyed, and upon our power to supply the answer to this question depends the future of surgery in spinal injuries.

The functions of the spinal cord may for all clinical purposes be divided into three heads:—

1. Conduction and co-ordination of motor and vaso-motor impulses.
2. Conduction and co-ordination of sensory impressions.
3. Discharge of various reflex functions.

With reference to the first two of these, the transmission of motor impulses and sensory impressions, both clinical experience and experiments on animals prove that compression of the cord alone is quite capable of completely abolishing them, temporarily, at least.

A case which occurred in Jervis-street Hospital, under the care of my friend Dr. Cranny, illustrates this. The patient had all the symptoms of severe spinal injury, with loss of motion and sensation, but recovered completely after some days, when a partial dislocation in the cervical region was reduced by traction.

Clinical observations also show that a comparatively moderate amount of injury or pressure is sufficient to annihilate all motor functions in the cord, but that sensory phenomena occasionally persist, even in cases where the cord is seriously disorganised.

We are, I think, therefore, justified in inferring that the loss of motor power does not prove that the cord is injured beyond relief, provided that sensation still persists; but that if *complete* loss of sensation occur with complete loss of motor power below the injury, improvement from operative interference can hardly be hoped for.

The third function of the cord, that of manifesting reflex phenomena, is more intricate and more likely to be of guidance to the surgeon. The exact physiology of the reflex functions of the cord is at present in some doubt. Some years ago, when the physiologist divided the spinal cord in a frog, he found that that useful and interesting creature developed the most extraordinary reflex activity, with the details of which you are all familiar, and with which I need not now burden you.

Experiments on the larger animals seemed to confirm the information thus obtained, and straightway the physiologist and neuro-pathologist enunciated the theory "that reflex centres existed in the cord, that these centres were controlled by the brain or medulla under normal circumstances, and that when such control was removed by division of the cord, the centres became capable of developing unusual activity." For many years this theory was taught by physiologists, biologists, and clinical teachers; duly absorbed by students, and Bastian's voice, the only one raised against it, on the ground that it was unsupported by clinical experience, became as "the voice of one crying in the wilderness."

Thorburn's clinical researches, however, in cases of spinal injury brought help to the solitary Bastian, and completely

cut the ground from under the feet of the scientists by demonstrating conclusively *that all reflex functions were abolished below the injury whenever the spinal cord in man was completely divided.*

This was a staggering blow to the experimenters, but they soon developed new theories to meet the assault. Feeling unwilling to part with their cherished tradition, inherited from the original experiment in the frog, they have modified it somewhat, and now offer the choice of two theories to the anxious surgeon looking for light and guidance. According to the first of these theories, it is alleged that there are reflex centres in the spinal cord of man, but that they are easily disorganised, and that when the cord is injured above these delicate structures they rapidly succumb.

This theory supplies nearly all that is required, and has the additional merit of making it easier for the physiologists at a further stage to deny the existence of any reflex centres in the cord at all.

The alternative theory to this attributes great importance to the cerebellum. It is asserted that the reflex centres exist in the cord, but that they are incapable of independent manifestations of energy, and that they are normally inhabited by impulses reaching them from the brain and stimulated by impulses reaching them from the cerebellum. That, therefore, when the fibres from the brain are injured, the reflexes will be exaggerated, and when those from the cerebellum are injured the reflexes will be diminished.

I mention these theories, not in the belief that they are of the least use from a clinical point of view, but because they are not only illustrative of the intellectual gymnastics which are so popular at the present day, but because they furnish us with a fair illustration of how much benefit the surgeon derives from the labours of the experimentalist in this particular branch of study.

Leaving theories aside, and coming to clinical facts, increasing experience has shown that all reflex phenomena below the injury disappear for ever when the human cord is seriously crushed or actually divided, and on the other hand that the persistence of reflex irritability is sufficient to justify us in inferring that the cord is not hopelessly crushed or divided.

I might sum up this part of my paper by stating the following propositions :—

1. That when after spinal injury paralysis affects both motion and sensation, and is associated with loss of reflex irritability, the cord is hopelessly injured.

2. That when paralysis affects motion only and sensation and reflex phenomena are still present the cord is not injured beyond all hope of relief.

3. That the persistence of reflex phenomena is proof that continuity of the cord is not completely destroyed.

4. That all functions, motor, sensory, and reflex, can be lost without the cord presenting to the naked eye very obvious signs of disorganisation.

Analysing these propositions we find that the only cases which hold out hopes to the surgeon are those in which motor paralysis is either incomplete, or if complete is associated with persistence of sensibility and of reflex activity.

In what cases, then, can such phenomena be found? Obviously only in those in which the cord is compressed and, mayhap, bruised or slightly torn.

Now the cord can be compressed in a great variety of ways in spinal injury, and it will be necessary to examine these at some length before we can get a clear comprehension of the conditions which justify, and those which fail to justify, operation. Excluding gunshot wounds and stabs, we find that the violence which fractures the vertebræ, or any part of them, may be inflicted in two ways, either by being

directly applied to the back or sides, as in the case of a lad treated in Steevens' Hospital, who, when falling from a high tree, struck a large branch near the ground, causing fracture with complete separation and dislocation at the tenth dorsal vertebra, or indirectly, as in the case of a young man who was killed by falling from a horse straight on his head.

When the violence is applied directly, and is so great as to cause actual displacement of the vertebral segments, it is obvious that the cord must be hopelessly crushed at the time of the injury, and that operation in such cases is not to be thought of.

When, however, the violence applied to the spine is not so severe as this, a part of the energy will be expended on the muscles and ligaments of the spine, and the remainder, though sufficient to fracture the neural arches, and thus compress, bruise, or tear the cord, may at the same time be insufficient to produce complete disorganisation, and thus leave a condition offering some hope of relief by surgical interference.

On the other hand, when the spinal column is fractured as the result of violence, indirectly applied, as in the case of a man diving into shallow water, or falling from a height on his head, in nearly all such cases we find that the cord is seriously injured, and that, too, in a manner that offers but little hope of relief by surgery.

The reason of the hopelessness is easily understood when we analyse the mechanism of such injuries.

When the spine is broken by force applied in the direction of its long axis, such force tends to increase the normal curves in the spinal column, and thus to diminish its vertical height. When the curves are thus forcibly increased we find that two very opposite conditions are produced in the spine.

Along the concavity of the curve the bony tissues will be forcibly compressed, while along the convexity of the curve

they will be in the condition engineers speak of as "tension," or, to put it in another way, the tissues in the concavity will tend to approximate those in the convexity to separate. The result of this is that any fragments of bone that may be separated will be forcibly impelled from the front when the pressure is positive, to the back when the pressure is negative, and thus become embedded in the cord. In this way the most terrible injury may be done to the cord without any external disfigurement being present to mark its occurrence.

Moreover, the effects of these injuries are not amenable to surgical relief for two reasons:—First, because the cord is at once divided by the jagged fragments propelled against it with such terrible force, and consequently the removal of the fragments will not restore the functions of the injured organ. Secondly, because the fragments are in the anterior aspect of the cord, and any operation for their removal must necessarily be a very extensive one, and involve very free handling of that delicate organ, so that on the whole I think it may be laid down as an axiom that when the spinal fracture is due to indirect violence, causing forcible flexion of the spine, any operation is to be condemned unless the paralytic phenomena are of a mild type.

I may now sum up by offering the following propositions for debate:—

1. That in certain cases of spinal fracture an operation may be attempted with reasonable hope of benefit.

2. That those cases are alone likely to be successfully treated by operation in which the cord is not completely crushed or divided.

3. That the existence of motor paralysis alone is not proof of hopeless injury to the cord.

4. That the persistence of sensation shows that the cord is not hopelessly injured, even though motor palsy be present.

5. That the complete permanent absence of all reflex phenomena is proof that the cord is hopelessly damaged.

6. That where the symptoms are caused by indirect violence applied to the spine, as a general rule operation is not to be thought of.

7. That where the symptoms are caused by direct violence the propriety of operating depends upon the severity of the injuries and accompanying symptoms.

8. That when the injury is caused by direct violence, if the reflexes persist, and if sensory impressions are still appreciated, an operation may be attempted with reasonable hopes of benefiting our patients.

9. That when the symptoms are due to pressure from extravasated blood operation is to be advised.

10. That the terrible fate awaiting most patients suffering from severe spinal injury justifies even the most hazardous operations if any hope of benefit therefrom can be reasonably entertained.

Mr. F. A. Nixon said that through the courtesy of Mr. Myles he had an opportunity of seeing the case. The operation was performed with great manipulative skill, and the cord on exposure seemed to him to be intact and surrounded by its normal coverings. The difficulty, of course, in such cases as this was to make out accurately to what extent the spine had been injured by the original accident. Apart from that, the great severity of the operation, which required deep incisions, and the removal of the laminæ in cases of spinal injuries, does not seem to favour surgical interference.

Mr. Doyle mentioned the case of a child, five and a half years old, whom he operated on. She came into hospital suffering from paralysis, increased tendon reflexes, rigid muscles, and cystitis. After removing portions of the vertebræ, which were exhibited at the Section last year, there was a temporary improvement for a few days. As this did not continue, he suspected abscess formation causing compression of the cord. He had no difficulty in letting

out the abscess, but experienced a great amount in keeping it open, and the child died six weeks after from cystitis and renal trouble.

Mr. Kendal Franks said that laminectomy was an operation not likely to appeal to their experience, because they were not often called upon to operate in cases of spinal fracture. Mr. Myles was to be congratulated on attempting the operation, and he thought from the history of the case he was perfectly justified in performing it. The most contentious portion of his paper was the physiological one, but it was scarcely the subject for discussion in a surgical meeting. He did not agree with Mr. Myles in his agnosticism regarding the physiology of the spinal cord. He thought his disbelief in the physiology of the reflex centres unusually heretical. With regard to the surgical aspect of the question, he thought Mr. Myles acted very properly in removing the long portions pressing in upon the spinal cord, but he did not tell them what the appearances were before he opened the investing sheath. The point of surgical importance was why he opened it? In cases of laminectomy for spinal disease the dura mater should not be opened unless absolutely necessary. That had been laid down by Mr. Victor Horsley. He (Mr. Franks) had done laminectomy for spinal disease, and he thought it a very valuable operation in suitable cases. He asked Mr. Myles what reasons he had for opening the sheath. He had no doubt that if the theca was found to be bulging from pressure under it, Mr. Myles was perfectly right in opening it; but if the pressure were due alone to fragments of bone pressing on the outside of the sheath, that was a different matter. In conclusion, he said the paper, although heretical, was of great importance and interest.

Dr. J. Barton inquired as to the condition of the cord on making a *post-mortem.*

Mr. Myles, in reply to Mr. Barton, said that no microscopic examination had been made owing to the specimen having been mislaid. The cord had the appearance of being slightly bruised and flattened, but its continuity did not appear to be disturbed. He joined issue with Mr. Franks that the discussion of the physiology of reflex action at a surgical meeting was inappropriate. He thought that anything which contributes to the accuracy of diagnosis was part of the surgeon's armament. If the frog in his gyrations gave them certain information, they should not be above receiving it. They should not accept any haphazard experiments without comparing them with their own clinical results. As far

as his own experience went, all independent reflex action of the spinal cord existed only in the imagination of the physiologist. Then as to the appearance of the spinal cord, he was only familiar with its appearance in the cadaver. However, the dura mater seemed both to his colleagues and himself, and to Mr. Nixon, more prominent than it ought to be, and when pressed upon it gave a sense of fluctuation; and as the phenomena outside were insufficient to account for the paralysis, it was resolved to puncture lest there might be any possible compression from blood, &c. He had hoped the physiologists would be present, as he thought they might enlighten them regarding the process of evolution which the physiology of the spinal cord was undergoing at present.

FIBROUS STRICTURE OF THE ŒSOPHAGUS TREATED BY GASTROTOMY AND RETROGRADE DILATATION.

By KENDAL FRANKS, M.D., F.R.C.S.;

Surgeon to the Adelaide Hospital, Dublin.

[Read in the Section of Surgery, January 12, 1894.]

In March, 1890, I had the privilege of laying before the Academy the details of four cases of fibrous stricture of the œsophagus treated in various ways. One was treated by gradual dilatation, the treatment occupying over seven months. One was treated by electrolysis alone, the current being applied on eleven occasions, extending over a period of four and a half months. In the remaining two cases immediate dilatation or rupture was employed followed by the use of bougies, in one case daily for two months, in the other, in which this treatment was supplemented by electrolysis, for eighteen days. I am glad to be able to report that in all these cases the patients are at the present time in good health and in no way troubled by their former strictures.

I now desire to add to this list a case of fibrous stricture of the œsophagus situated near the cardiac orifice, which, owing to the difficulty of getting through it bougies passed through the mouth, required to be treated by a method different to any I had hitherto employed.

Case.—The case was that of a young lady, aged twenty-four, who consulted me on June 16, 1892, for dysphagia. The history of her trouble began when she was seven years of age, after an attack of scarlatina. For two years after that she found the greatest difficulty in swallowing solids. Sometimes when taking a long drink she felt as if something were sticking in her throat. At the end of two years she was able to take soft solids, but it was

several years before she was able to eat meat. At this period she was living in Belfast, but five years previously to my seeing her she came up to school in Dublin. In 1890, as the dysphagia was becoming worse, she consulted Dr. M'Cutcheon. In June, 1892, he kindly sent her to me. She told me that every mouthful felt as if it would choke her, especially if it were a little larger than usual. On one occasion about ten years previously a piece of citron had stuck in the gullet, and did not come up again for a month. Sometimes she found even fluids difficult to get down, especially if they were effervescing. She never suffered from nausea, the food, as a rule, simply regurgitating shortly after it was swallowed. The severity of the symptoms varied a good deal, and was increased when she was in a strange house or by nervousness. Her general health was good and all the functions normal. As a rule she was not able to get down sufficient food to satisfy her hunger, and she was losing flesh. She was anæmic, and had lost strength and energy. She was five feet two and a half inches in height, and weighed five stone seven pounds. A year previously she weighed eight stone.

On examination with a full-sized œsophageal bougie, I found that it passed readily down the œsophagus until it reached a point about twelve and a half inches from the teeth. Here it was arrested. I then proceeded to determine as nearly as possible its exact position.

The stricture was 12½ inches or 32½ cm. from the teeth. Mackenzie gives the distance of the opening of the œsophagus from the teeth as 15½ to 17 cm. Assuming that in a girl of her size this distance was approximately 16 cm., the obstruction was situated at a point about 16½ cm. from the upper opening of the œsophagus. Now Mackenzie states that the normal length of the œsophagus in the adult is 24 to 26 cm. Supposing that the lesser figure was near the truth in this case, the stricture was situated about 7½ cm. from the cardiac orifice—that is, nearly 3 inches.

I tried repeatedly to get a bougie to pass. The impression which my attempts made upon my mind was that I had to do with a largely dilated *cul-de-sac* low down in the œsophagus, at some portion of the floor of which there was an opening, if only I could find it. There was evidently no growth to deal with, judging by the sensation conveyed through the bougies. The success which attended these attempts was very limited. On three occasions only, on June 16, 18, and 21, I succeeded, after prolonged probing

with the bougie, in getting instruments which measured seven millimetres (a little over a quarter of an inch) in diameter through the stricture. I could not get a larger instrument, and the only good which resulted from passing these bougies was the information they afforded as to the nature of the stricture with which we had to deal. They showed that the stricture was firm and quite smooth and regular.

On June 30, Dr. Ball met me in consultation. He again endeavoured to pass bougies, but failed to find the opening. We came to the conclusion that the best thing to do for the patient was to attempt to reach the stricture from below through an opening in the stomach. The advantages of this method of reaching the obstruction were that, as the measurement showed the stricture to be about three inches from the cardia, it would be possible to reach it and possibly to bore through it with the finger; secondly, the œsophagus below the stricture not being dilated as it was above, it would be a much simpler matter to guide an instrument through the stricture from below, and there seemed to be very little likelihood of dilating the stricture from above. The risks and advantages of this method were placed before the patient, and she readily agreed to operation, feeling that any risk was worth incurring provided she could be relieved from the slow process of starvation she was undergoing.

On July 6 the patient was placed under anæsthesia by Dr. Piel, at 10 30 a.m. Dr. Ball assisted me at the operation, and Professor Lannelongue, of Paris, and Dr. Heron Watson, of Edinburgh, favoured me with their presence. An incision five inches in length was made in the middle line from the ensiform cartilage downward. When the peritoneum was opened the left lobe of the liver appeared, and behind and to the left of this the stomach was found. It was so contracted that it looked at first like the colon, but when it was drawn outward through the wound the absence of white bands and the arrangements of the blood-vessels proved it to be the stomach. An opening about an inch in length was then made into the stomach through its anterior wall about midway between the curvatures and at an equal distance from each orifice. The wound all round the opening was well packed with sponges, and the stomach was washed out with warm boric solution. Nothing but mucus and gastric secretions was found in the stomach. I then passed my right index finger into the stomach and my whole hand into the abdomen, and, pushing the anterior wall of the stomach

before me, I readily found the cardiac orifice up behind the left lobe of the liver. When I had passed my finger up the œsophagus as far as it could reach, I just succeeded in reaching the stricture and exploring it, but the length of my finger would not permit me to do more. As, from the measurements I had taken, I had anticipated this difficulty, I had an Otis dilating urethrotome in readiness, with the blade removed. I now passed this instrument up along my finger through the cardiac orifice, and, guided by my finger, it readily passed into the stricture, which it fitted fairly accurately. The dilator was then screwed up to its full limit of expansion in an antero-posterior direction, and was then withdrawn fully dilated. A flattened œsophageal bougie was then passed down the œsophagus from the mouth, but it impinged on the stricture and refused to pass further. The dilator closed was again passed upward and again fully expanded, this time in a lateral direction—that is, at right angles to the former dilatation. It was again withdrawn fully open. The bougie passed from the mouth now emerged into the stomach without the smallest difficulty. I drew its extremity out through the abdominal wound and bored a hole through it. Through this hole I passed a stout piece of silk and knotted it firmly. I then withdrew the bougie back along the same road it had already traversed, carrying the silk with it. I now had a strong silk thread passing from the mouth through the œsophagus, the stomach, and out through the abdominal wound. A plug of gauze was now made about the size of the finger. To one end of this the lower end of the silk was fastened securely. I then fastened another piece of silk to the other end of the plug, and by means of these silk threads I was able to draw the plug upward and downward through the stricture, which it traversed with comparative ease. Finally, I allowed the plug to remain in the stricture, and then I cut short the lower end in the stomach, leaving the upper line of silk hanging from the mouth.

The wound in the stomach was now closed by a continuous suture of fine silk, uniting the mucous coat, and a second continuous Lembert suture, which united the peritoneal coat. The stomach was then allowed to fall back into the abdomen. When the "toilet" of the peritoneum was completed the abdomen was closed by two rows of sutures, the first uniting the peritoneum, the second embracing all the other layers, including the skin. The dressings were applied, and the patient, who bore the operation very well, was removed to bed, and $\frac{1}{8}$ grain of morphia with $\frac{1}{120}$

grain of atropia was administered hypodermically. She was ordered peptonised nutrient enemata every four hours. At 6 P.M. I withdrew the plug. She was allowed to suck a little ice, but nothing else was given by the mouth until the fourth day, when four ounces of milk and two drachms of Denayer's peptonate of meat were given alternately every fourth hour. The enemata were discontinued on the fifth day, as she was then able to swallow her nourishment well. On the ninth day she was allowed fish and bread and milk, and chicken on the tenth day. On the thirteenth day I passed a bougie with ease into the stomach; but that night she suffered some pain, and the next day there was a slight rise of temperature, which, however, came down the following day; but at no time during her convalescence did the temperature exceed 100·2° F.

On the twenty-first day she walked up to my house to see me. She was then able to eat good solid meals without the smallest difficulty or pain.

For over two months I made no further attempts to pass a bougie. On the 28th of September, 1892, I found the patient very much improved in health and condition. She now weighed six stones thirteen pounds as against five stones seven pounds on June 30—that is, a gain of nearly a stone and a half.

I also found that I could pass a bougie No. 27, French gauge, with ease. On September 30 I passed a bougie measuring $1\frac{7}{16}$ inches in circumference. On October 26 I began electrolysis, and repeated it at intervals varying from a fortnight to a month until January 25, when my largest electrode, measuring two inches in circumference, passed with ease. Since then I have passed at intervals of from one to two months large bougies measuring $2\frac{1}{8}$ inches in circumference, which pass without any difficulty or pain. She enjoys excellent health.

The idea of attacking an impermeable stricture of the œsophagus, of a benign character, from below originated with Professor Loreta, of Bologna, and his first operation was performed in October, 1883.

As the case I have just recorded is, as far as I am aware, the first of the kind performed in the United Kingdom, it may not be uninteresting if I refer shortly to the history of

the operation and point out the various modifications which have found favour with operators. Including the case I have recorded, the operation has been done 21 times, of which 7 have been performed in Italy, the country of its birth, 3 have been done in America, 1 in France, 9 in German-speaking countries, and 1 in Ireland. Of these 21 cases, the result is known in 20. These all recovered. I have been unable to find the result of Case 13.[a]

On examining the record of these cases, it will be observed that surgeons have employed one of two methods in carrying out the treatment of œsophageal strictures by dilatation from below. The whole process may be completed at once, or it may be divided into two stages.

As originally proposed and carried out by Loreta, as soon as the stomach has been exposed it is opened, the cardiac orifice is sought for, a dilator, guided by the finger, is passed through the stomach into the œsophagus and is insinuated into the stricture, and the stricture is at once forcibly dilated. That sufficient has been done is tested by the passage of a bougie from the mouth downward. The stomach wound is then immediately closed, the abdominal wound sutured, and the operation completed.

The other method consists in at first performing gastrostomy—that is, in fixing a piece of the stomach into a wound made in the left epigastric region. The stomach is not usually opened for two or more days, and nothing further is done until a gastric fistula has become firmly established. When this is attained (in Dixon's case, Case 18, twenty-four days after gastrostomy) the stricture is attacked through the fistula, generally assisted by the passage of various devices from above. When dilatation has sufficiently

[a] I have not included in this list the case reported by R. F. Weir in the New York Medical Record, 1891, XL., 89, as, although gastrotomy was performed, the stricture was subsequently dilated from above. It was not a case of retrograde dilatation.

advanced to permit of the further treatment being carried out from above, the gastric fistula is allowed to heal, or is closed by a plastic operation.

Each of these methods has its own advantages. The former, or Loreta's method, completes the operation at once, and nothing remains to be done except to secure the patient against the risks of recontraction by the occasional passage of a bougie through the mouth. The recovery is rapid: in Loreta's first two cases, eighteen and twenty days respectively; in my own case, twenty-one days. Again, the immediate method enables the surgeon to make a digital examination of the stricture, even if it be situated as high up as three inches above the cardiac orifice. It is impossible to explore even the cardiac orifice with the finger through a gastric fistula, unless the patient be a child and the fistulous opening in the stomach be large enough to admit the finger. In a case recently in which I had the opportunity and privilege of assisting Mr. Myles, we found it impossible to pass the finger into the lower end of the œsophagus, except after the introduction of the entire hand into the cavity of the stomach. We then discovered the stricture about three inches from the cardiac; but, unfortunately, it proved to be malignant, and dilatation was impossible.

The second method, or the operation *à deux temps*, may perhaps be shown to have some slight advantage on the score of safety, but this I very much doubt. The table of cases which I have drawn up does not help us in this matter, as they do not show a fatal result from either method of procedure hitherto. But even if there were some slight additional immediate risk in Loreta's method, this is more than counterbalanced by the advantages, immediate and remote, of finishing the operation at once, and leaving the patient without a gastric fistula, which at any rate in one case, Case 16, had not closed at the end of fifteen months.

There is, however, one class of cases in which Loreta's method would not be admissible, and in which the establishment of a gastric fistula becomes a matter of necessity. In cases of extensive injury to the œsophagus, caused by swallowing a strong corrosive, such as sulphuric acid or caustic potash, where the greater portion of the whole length of the œsophagus is in a strictured condition, it would be manifestly impossible to employ immediate dilatation for its relief. A prolonged system of gradual dilatation with bougies can then alone be relied on, and this can be carried out more easily and more surely from below than from above. In such cases the operation *à deux temps* has an established and unassailable position in surgery.

In examining the table of cases we find that the operation *à deux temps*, when a gastric fistula is formed as a preliminary, has been performed thirteen times, while Loreta's method has been carried out eight times. It is evident, however, that the principle which guided the operators in the selection of the method had nothing to do with the nature of the stricture. It appears to be a question of nationality. Loreta's method was employed in the seven Italian cases and in my case. In France, Germany, and America the operation *à deux temps* has been invariably adopted. It is difficult to account for this except by the supposition that there is diminished risk in fixing the stomach into the wound of the abdomen some days previous to opening the stomach itself. I believe, however, Loreta's method will come more and more into use, for the reason that, with proper precautions, the risk of opening the stomach at once can be reduced practically to *nil*, whilst if we form a fistula we must forego certain other very decided advantages to the patient.

TABLE OF CASES OF ŒSOPHAGEAL STRICTURE TREATED

No.	Operator	Where Published	Age	Sex	Duration of Symptoms	Cause
1	Loreta. 1883	Rep. by T. Holmes, Brit. Med. Journal, Feb. 1885.	24	M.	11 months	Swallowing Caustic Alkali
2	Loreta -	Ibid. - -	26	F.	8 years	Idiopathic -
3	Do. -	Ibid. - -	21	F.	—	—
4	Do. -	Ibid. - -	—	—	—	—
5	Catani - (Florence)	Ibid. - -	—	—	—	—
6	Frattina - (Brescia)	Ibid. - -	—	—	—	—
7	Bergmann -	Berlin Klinische Wochenschrift., 1883, p. 685.	—	—	—	Caustic Potash -
8	Lenattan -	Centralblatt für Chirurgie, 1884.	12	F.	—	Sulphuric Acid -
9	Caponotto -	Centralblatt für Chirurgie, 1885, p. 446.	5	F.	—	Do. -
10	Hjart - -	Centralblatt für Chirurgie, 1886, p. 69.	14	F.	—	Caustic Potash -
11	Maydl -	Wien. Med. Zeitung, 1886, p. 287.	22	M.	—	Caustic Soda -
12	Soldani -	Centralblatt für Chirurgie, 1887, p. 787.	24	M.	—	Sulphuric Acid -
13	Socin - -	Schweizer Korrespondenzblatt, 1889.	8½	F.	—	Do. -
14	Spannoche -	Raccoglitore Med. Foclè, 1890. X. 297.	—	—	—	—

BY GASTROTOMY AND RETROGRADE DILATATION.

Method of Treating Stricture	Treatment of Stomach Wound	Result	Remarks
Immediate dilatation -	Stomach wound closed and organ returned to abdomen.	R.	In 18 days
Do. - -	Do. -	R.	In 20 day
Do. - -	Do. -	R.	—
Do. - -	Do. -	R.	No details
—	—	R.	No details. Seen in perfect health 7 months later by Prof. Loreta
—	—	R.	No details
Sponge tent passed from below	Gastric fistula formed.	R.	Fistula healed in 1 month
Dilatation with pharyngeal forceps from below	Gastric fistula -	R.	Fistula closed in 3 months
"Olives" drawn up from below, following rod of a Verneuil's dilator	Do. -	R.	Fistula closed in 1 month Death 7 months later from tubercular meningitis
Electrolysis from below -	Do. -	R.	Fistula closed in 4 months
Hagenbach's method. Conical bougies drawn upwards	Do. -	R.	Gastric fistula not closed at time of publication
Hagenbach's method -	Do. -	R.	Two months later patient improved; but still under treatment
Hagenbach's method. Increasing sizes of violin strings drawn upwards through stricture; each string remaining *in situ* for about 2 hours	Do. -	—	No result given
Immediate dilatation -	Stomach wound closed and organ returned	R.	—

TABLE OF

No.	Operator	Where Published	Age	Sex	Duration of Symptoms	Cause
15	F. Lange -	New York Med. Jour., 1890. LI., p. 131.	4	—	2 years	Concentrated Lye
16	Terrillon -	Progrès Médical, 1890. XI. 244.	58	M.	Many years	Idiopathic -
17	A. Dixon -	New York Med. Record, 1891. XL. 549.	54	M.	—	Idiopathic -
18	Kraske (Freiburg) -	Beitrage zur Klin. Chir. Vol. VIII. 1892, p. 109.	—	—	—	Injury caused by passing a stomach pump.
19	R. Abbe -	New York Med. Record, Feb. 25, 1893.	—	F.	—	—
20	Giesler -	Bruns. Beitrage zur Klin. Chirurg. Bd. VIII.	—	—	—	Idiopathic -
21	Kendal Franks	Present Communication.	24	F.	17 years	Scarlatina -

In advocating gastrotomy as a method of dealing with œsophageal stricture it should be distinctly understood that we do not suggest it as an alternative to the ordinary method of dealing with these strictures *from above*, such as dilatation, internal or external œsophagotomy, or electrolysis. As long as bougies passed through the mouth can be made to traverse an œsophageal stricture—that is, as long as the ordinary methods of treatment from above give any hope of a successful issue—so long the question of gastrotomy does not arise. It is only when the stricture is practically impermeable from

Cases—*continued.*

Method of Treating Stricture	Treatment of Stomach Wound.	Result	Remarks
Internal œsophagotomy from below. Blades drawn up by a thread passed by means of a whalebone bougie passed from above	Gastric fistula -	R.	Fistula closed on 18th day. Internal œsophagotomy per oram 5 months later.
Gradual dilatation -	Do. -	R.	Fistula open 15 months later, but patient otherwise well
Gradual dilatation 24 days after gastrostomy, first by bougies, then by uterine dilator	Do.	R.	Two months later recontraction. Digital exploration through fistula revealed the cardia to be seat of malignant growth
Hagenbach's method -	Do. -	R.	Fistula closed 4 months later
Abbe's "String" method	Combined gastrostomy and œsophagostomy	R.	Œsophageal fistula closed spontaneously in 2 weeks. Gastric fistula closed by plastic operation after 8 weeks
Hagenbach's method, with olive-pointed bougies -	Gastric fistula -	R.	Two months later fistula closed
Immediate dilatation with Otis' dilator	Stomach closed at once and returned.	R.	Well 18 months after

above that Loreta's method, or one of its modifications, becomes a necessity to save the patient from starvation, or from the short-lived misery of a permanent fistula in the stomach, through which he must be fed until nature requires sustenance no longer. It is noteworthy how frequently a fistula which seems to be impervious when tested by bougies passed through the mouth admits with comparative ease the bougie passed upward from the stomach. In the case I have reported it was only after prolonged efforts and after many trials that I succeeded in getting a bougie through the

stricture from above, and when it was once withdrawn I could not get another one in, and yet at the operation an Otis dilator passed through the stricture almost at the first attempt. Other operators have recorded the same experience; and the reason for it is easily understood. From the frequent efforts to take food, continued for months, it may be for years, the œsophagus above the stricture has become so greatly dilated as almost to form a large pouch. Somewhere at the bottom of this pouch there exists a small opening through which the liquid portion of the food can trickle.

The wonder, then, is that a bougie, probing about the floor of this well, strikes as frequently as it does the aperture and passes through it. This aperture may be so small or situated at one side in such a position that it cannot be found. The condition of the œsophagus at the other side of the stricture is quite different. Here there is no such pouch. On the contrary, the œsophagus is generally contracted by disuse and forms more or less of a funnel, so that a bougie passed from below is, as it were, guided to the stricture; and thus it happens that such an obstruction, which was quite intractable to treatment from above, can, with comparative ease, be dealt with from below.

But even when a gastric fistula has been established it may not be possible to pass a bougie through the fistula into the œsophagus and through the stricture without further assistance. An ingenious method of dealing with such cases was suggested by Hagenbach in 1889.[a] A small shot is fastened to the end of a long thread and then the shot is swallowed. Or a hollow bougie open at both ends is passed down to the stricture and the threaded shot passed through it to the stricture and the bougie withdrawn. The patient then is directed to swallow water, and by its aid the shot is

[a] Correspondenzblatt Schweizer Aerzte. 1889. No. 5.

carried through the stricture and appears inside the stomach. It is then caught and drawn out through the fistulous opening in the stomach. A strong silk thread is now fastened to this, and, by means of the end hanging out of the mouth, is drawn up through the stricture. We thus have a strong silk thread passing through the mouth, the œsophagus, and the stomach, the ends of which hang one out of the mouth, the other out of the gastric fistula. Both ends are then tied together. Every day a bougie is tied to the gastric end of the thread, and is drawn upward through the stricture, which can thus be rapidly dilated. The thread is not finally removed until the stricture is sufficiently dilated to allow of bougies being passed with facility without its assistance. Five cases are recorded in the tables as having been treated by this method. In one of these, Case 13, increasing sizes of violin-strings were substituted for the bougies at first. In Case 15, F. Lange succeeded in passing the threads by means of a fine whalebone bougie passed from above. To the gastric end of the thread he fastened a set of small blades, devised by himself, and then by traction on the other end of the thread coming out at the mouth he drew these blades into the œsophagus and thus performed internal œsophagotomy from below. The gastric fistula was closed on the eighteenth day. Five months later, as the stricture had begun to recontract, he performed internal œsophagotomy again, but this time the incising instrument was passed down from the mouth.

Case 19 shows yet another method of dealing with the stricture with the assistance of a gastric fistula. In this case, Abbe, of New York,[a] first opened the œsophagus near the root of the neck, and then he established a gastric fistula. He then succeeded in passing a very fine conical gum-elastic bougie upward through the stricture. To the end of this

[a] Annals of Surgery. 1893. Vol. XVII., p. 489.

bougie he tied a piece of strong braided silk and drew it through the canal. By pulling this string up and down in a see-saw manner over the distended stricture these tissues were gradually and rapidly divided, so that enlarging bougies were quickly able to pass with ease until the normal calibre of the œsophagus was restored. He proposes to call this method the "string" method. The patient was exhibited at the New York Surgical Society four months later, when the result was seen to be all that could be desired.

Electrolysis was the means employed in Case 10 by Hjart, and proved eminently successful. A sound was pushed up the œsophagus from the stomach, its extremity being an electrode; the other electrode was placed on the neck. The internal electrode was kept pressing against the stricture. The constant current was kept in action for an hour, after which the electrode passed suddenly and with ease up through the stricture.

Such are the chief modifications which have been suggested for what is sometimes called retrograde dilatation of œsophageal strictures. I think the record of cases which I have been enabled to lay before you is most encouraging.

In advocating this method of treatment, we do not propose an operation which is to drive from the field old and well-tried methods of dealing with these cases. We propose a plan, new, it is true, which promises to bring speedy relief to a class of cases which we have been accustomed to look upon as desperate and beyond the pale of the surgeon's art. That they are not so has now been proved; and those cases which in the future are rescued from starvation and its attendant miseries, as many have been within the past few years, will owe their lives, not so much to him who performs the operation, as to the master mind who devised it—to Loreta, of Bologna—who has again taught us that there is no finality in surgery.

Sir W. Stokes said there were many points of surgical interest and importance in this paper. There were three to which he might direct attention. The first of these was as to the relative merits of gastrotomy or gastrostomy in cases where the retrograde dilatation was to be performed. He gathered that Mr. Franks was in favour altogether of gastrotomy, and he was inclined to agree with him, because, where dilatation was to be performed, there were much greater facilities by performing gastrotomy than where they would have to work their way through a comparatively small fistulous opening in the stomach. Then again, in cases where gastric fistula is established there was always great difficulty in getting it to heal. The next point that occurred to him—and he hoped Mr. Franks would not think he was going to throw any doubt upon the accuracy of his diagnosis—was, that it struck him as being very remarkable, if this was a case of fibrous stricture of the œsophagus of nearly over 17 years' standing, that it should be so very amenable to the treatment of dilatation, and in that respect differing so much from what they knew by experience to occur in cases of stricture of other organs, particularly that of the rectum and urethra. Here they had a case of great chronicity, and on the 21st day after operation the patient was perfectly well. It was very exceptional, assuming it was a fibrous stricture, and he would like to hear Mr. Franks in reference to the possibility of its being a spasmodic closure of the œsophagus. This condition was by no means infrequent in persons of a neurotic tendency. And bearing on this subject, he mentioned the case of a man, aged forty-five, who was admitted into the Meath Hospital three months ago, suffering from acute pain in the right hypochondriac region, and which came on in paroxysms. On examination they found a distinct tumour, ovoid in shape, freely movable and smooth on the surface. He exhibited the case in the Biological Club, and very different opinions were expressed concerning the tumour, but all agreed that laparotomy should be done. He performed laparotomy, and made a careful examination of the contents of the abdomen, but no tumour could be found, and in fact everything appeared perfectly normal. The patient got well without any febrile disturbance; there was no recurrence of the tumour, and the paroxysmal pain has vanished. It occurred to him as to whether there was not a neurosis in a large number of these cases, having regard to the extreme amenability to the treatment and the immediate results that occurred after operation. There was one other point he would

wish to allude to, and that was to the operation of œsophagotomy in cases where the stricture occurred close to the cardiac end. And although the operation required a considerable degree of anatomical skill, still the dangers of the operation were not so great as in gastrotomy. By opening the œsophagus low down they would have as much facilities for dilatation as through the stomach. He merely threw out the suggestion, and he would like to have Mr. Franks' opinion on the point.

Mr. T. Myles thought there was nothing more difficult than to arrive at a correct diagnosis regarding obstructions in the œsophagus. The most experienced surgeons had erred in these intra-thoracic obstructions, and even allowing that the diagnosis is made, they had then to learn whether the obstruction was benign or malignant. He also thought the relations of the œsophagus to the diaphragm very important, and in many cases stricture of the œsophagus, close to the cardiac end, was due to some interference with the normal physiological opening in the diaphragm. Many of those cases which were cured by electricity and bougies, were merely strictures comparable to the "stammering" of the bladder in retention of urine. Another point of importance was the height to which the diaphragm ascends. In his own case the stricture was barely within reach of his finger when placed in the stomach, so that digital dilatation is only applicable to cases very low down. He believed Mr. Franks' case to be one of *bonâ fide* stricture successfully treated. He submitted that owing to the proximity of great vessels and nerves to the œsophagus, and to the fact that an instrument must form an acute angle with the œsophagus, the dangers of œsophagotomy were much greater than those of gastrotomy. In his own case he had little doubt that the stricture was malignant, and he believed that his patient died of inanition. He failed to see any analogy in stricture of the urethra, because in the latter case they had a canal composed of unyielding structures, and subject to the passage of irritating matters.

Mr. F. A. Nixon thought that the dilator should not be used as long as the finger could reach the stricture. He found from examinations on the dead subject as well as from Mr. Myles' case, that when the hand is passed into the stomach with the finger in the œsophagus, the cardiac auricle rested in the palm of the hand, and very slight pressure would cause it to perforate the œsophagus and wound the auricle. He thought the operation of gastrotomy much more simple than opening the œsophagus.

Mr. Tobin said that among the various measures enumerated for the cure of the stricture, no mention had been made of leaving in a tube for a considerable length of time with a view of bringing about gradual enlargement of the stricture. He thought the passing of the threads through the œsophagus, and into the opening in the stomach, a very admirable method; but if a full-sized instrument occupied the place of the thread its pressure might bring about absorption, just as occurred in urethral stricture. The operation, as suggested by Mr. Franks, seemed to him to possess great advantages, because, even if they failed to get the stricture dilated, they would still have means left of getting food into the stomach, which would not exist where œsophagotomy was performed. In the cases of œsophagotomy that he had to deal with he had always great difficulty on the question of drainage. He did not know of any wound more difficult to keep aseptic, because the pus was very difficult to drain, and the sterno-mastoid usually fell over the opening. If only for these reasons he always preferred the operation of gastrotomy.

Mr. Wheeler said he could not agree with Mr. Myles as to the difficulty or danger of œsophagotomy. He performed the operation on four different occasions, and he avoided all the vessels which Mr. Myles dreaded so much. He thought the best method of keeping the wound aseptic was to drain with catgut. The question to his mind was, whether they could dilate a stricture 3 inches from the stomach by opening the œsophagus through the neck.

Mr. Myles wished it to be understood that he used the word *difficult* in a relative sense, and of course they would not meet with such large blood vessels in opening into the stomach as they would in œsophagotomy.

Mr. M'Ardle said that in performing the operation of œsophagotomy he had no difficulty, but he had a good deal in guiding a bougie through the stricture. He opened it high up on account of cellulitis having occurred where the opening in the œsophagus originally occurred. In dilating the œsophagus, he found it easier to work from the mouth—and why perform the operation when they had a natural opening above?

Mr. Kendal Franks, in reply, tendered his sincere thanks for the kind manner in which his paper had been received. His paper did not deal with the question of œsophagotomy, but he thought it was quite proper to discuss whether œsophagotomy might not

possibly be a better method than gastrotomy. He was quite well aware that Dr. Grazer, of Erlangen, maintains that it is much easier to reach the stricture through an opening in the œsophagus than through the mouth, and that the bougie can be passed with much greater ease. His (Mr. Franks') great objection to œsophagotomy, as compared with gastrotomy in cases of almost impermeable stricture, was the difficulty of finding the small opening from above. They might sometimes as well look for a "needle in a bundle of straw" as find the small opening from above. But when dealing from below, it was comparatively easy to pass the bougie, because they had not a dilated œsophagus to deal with. In reference to Sir William Stokes' case in the Meath Hospital, he considered it was a case similar to those described by Mr. Mayo Robson, of adhesions within the abdomen, the result of some previous inflammatory process. In exploring the abdomen, these adhesions became freed, and the pain subsequently disappeared entirely. He could not look upon such cases as purely neurotic. In the case of stricture he had reported, there could be no doubt whatever as to the diagnosis. During anæsthesia, in the course of the operation, the stricture was carefully explored with the finger. He considered that spasmodic stricture of the œsophagus was much more uncommon than fibrous stricture. By examination with bougies he did not think it was likely that a spasmodic stricture could very easily be mistaken for an organic obstruction, but he had frequently found in cases of fibrous stricture the diagnosis of spasm or hysteria made, which simply meant that the patient was left untreated for months or years.

SOME INTERESTING CASES OF GUNSHOT WOUNDS.

By AUSTIN MELDON, D.L., F.R.C.S.;
Senior Surgeon to Jervis-street Hospital.

[Read in the Section of Surgery, January 12, 1894.]

During the twenty-seven years it has been my privilege of being connected with Jervis-street Hospital a considerable number of gun-shot injuries have been treated in that Institution. On looking over my hospital case-book I have selected three which I thought of sufficient interest to lay before this Section of the Academy:—

Case I.—On 16th September, 1884, a lad of some sixteen years of age was admitted into hospital. About an hour previously he had been examining a revolver in the hands of a friend. While in the act of doing so it went off, and the bullet struck him a little below the sternum towards the right side. When I saw him he was in great pain, and blood freely flowed from the wound. I satisfied myself that it had entered the abdomen, but had not escaped. The wound was dressed with cotton wool and lint soaked in compound tincture of benzoin, and the patient put on full doses of opium. Next day acute peritonitis was well marked, and the dressings were stained with bile which was escaping from the wound. From the second day the inflammation subsided, and in ten days the patient was free from all unfavourable symptoms, save the escape of bile from the fistula. This, however, closed without trouble, and in one month from the time he entered hospital he was discharged cured.

Case II.—The second case is that of Mrs. C., residing in 7 Temple Buildings, Dominick-street, aged forty, who was shot on January 2nd, 1887, by her husband. The distance was only a few yards, and four bullets struck her. The first went through the muscular portion of the right arm, and was subsequently found in the room. The second lodged in the right wrist, and which I had considerable difficulty in separating from the bones of the joint in

which it was embedded. The third, which entered the abdominal cavity on the right, midway between the umbilicus and spine, lodged in the left groin, from which position I extracted it. The last entered a little to the right of the sternum, close to the breast, and was found in the muscle on the other side of the thorax, having passed through the lung. This I also removed. She coughed up a considerable quantity of blood, and suffered a deal from abdominal pains. Nevertheless, she gradually improved, and on the 5th of February was able to leave the hospital cured, a slight cough being the only remaining symptom.

Case III.—The last case which I wish to mention is that of E. G., of Manchester, bandmaster, aged twenty-eight, who was admitted on the 7th July, 1888. Whilst carelessly examining a revolver with some companions he was accidentally shot. The bullet entered on the side of the chest just above the nipple of the right breast, and passed directly into the lung. When I saw him he was suffering severe pleuritic pain, and was coughing up blood in considerable quantity. Next day the quantity of blood decreased, and eight days after his admission the temperature, which at one time had risen to 106°, was normal. The cough, however, still remained, and was much increased by the slightest exertion, but caused him very little trouble as long as he remained in bed. On the 10th of August, against advice, he left the hospital.

He was again admitted in the middle of August in a moribund condition. The lips were blue, and the respiration was hardly perceptible. An examination revealed the fact that the pleura was full of pus. He was placed on the operation table, and an incision made posteriorly. I then passed my two fingers into the pleural cavity, and the gush of pus which followed carried the bullet between my fingers. Pushing them forward with a view of getting a firmer hold stopped the flow, and the consequent removal of the pressure caused the bullet to slip away. Withdrawing my fingers a little was followed by another rush of matter, and therewith came the bullet again well within my grasp. I now succeeded in extracting it. The patient made a good recovery, and left the hospital on the 6th October.

Mr. Myles mentioned the case of a young policeman who was shot in the right side of the neck under the sterno-mastoid, and

the wound healed perfectly. He had torticollis, and as they thought he was malingering they put him under chloroform, and the spasm disappeared, but subsequently reappeared. He also got paralysis of the right arm, and all the time confidently asserted that the bullet was in his neck. His view was the correct one, for the bullet was extracted a considerable number of years after by another surgeon. Another case was that of a man struck in the thigh, and the bullet ran in the line of his femoral artery. He suffered from no pain or trouble, and the wound healed up with the bullet still in the leg. He also mentioned the case of a man who shot himself through the mouth. The bullet lodged in the base of the brain after shattering the sphenoid, and a lot of brain matter came away, death following soon after.

Mr. Tweedy mentioned the case of a young man who shot himself while in the park, and subsequently walked to the hospital. There was a hole below the right nipple and a lump on the side of the spine, indicating where, as they thought, the bullet was. He died of peritonitis, and it was found that the bullet had gone through both walls of the stomach.

Mr. Tobin said that no one could show a better record than that of Mr. Meldon.

Mr. Wheeler mentioned a case of a young man shot below the ensiform cartilage who recovered. He was also called to a case in Kilkenny, where an officer was shot through the temporal region, and the bullet lodged in the brain. He had no symptoms save that he could not speak, and that there were some slight twitchings of the face. He passed a probe and hit the bullet, but refused to operate on account of the absence of symptoms. The patient was now quite well. He next referred to a gamekeeper who shot himself with a revolver on the side of the neck. He got aphasia and paralysis of the right arm and leg. There was no aperture of exit, so he adopted no treatment, and the man got gradually well. His next case was one in which a man shot himself in the gluteal region, and the bullet travelled round towards the great trochanter. He removed it along with the anterior and external portion of the femur. His next case was a penetrating wound of the lung, and whenever the person spoke a hissing noise could be heard at the back of the lung.

Mr. F. A. Nixon mentioned the case of a young man brought into hospital suffering from a very slight wound in the foot, with some discoloration. He was walking in a procession, and thought

that somebody must have trod on his foot. The wound was dressed, and subsequently an abscess formed. At the bottom of it they found a revolver bullet.

Mr. Wheeler also referred to a bullet found in the pericardium of a man who died in Baggot-street Hospital. He received it at the battle of Salamanca.

Mr. Kendal Franks mentioned the case of an American who came to him some years ago to have a bullet removed from the frontal sinus. He had apparently attempted to commit suicide by holding a revolver beneath the jaw and firing upwards—that was about two months previously. The track of the bullet was manifest. It had gone through the tongue, through the hard palate, up through the left nostril, and entered the left frontal sinus. The point of the bullet had impinged on the edge of some bone, because it was found split, and the bullet had turned completely round so that its apex was downwards.

NEPHRORRHAPHY AND NEPHRECTOMY.

By J. S. M'ARDLE, F.R.C.S.;
Surgeon and Lecturer on Surgery, St. Vincent's Hospital, Dublin;
Assistant Professor of Operative Surgery, C.U.I. Medical School.

[Read in the Section of Surgery, February 23, 1894.]

THE cases which I shall bring before you cover a field so wide that discussion of them could not be attempted within the limit of this communication. I shall, therefore, narrate brief histories of each, and lay before you some points which I consider worthy of consideration.

NEPHRORRHAPHY.

CASE I.—B. H., aged nineteen years, came under my care on March 10th, 1888. She complained of severe abdominal pains of an intermitting character, and chiefly referred to the left of the umbilicus; pain was also felt up to the angle of left scapula, and down to anterior superior spine of left ilium and into thigh. Rest in the recumbent position relieved these symptoms, as also vomiting, which occurred whenever she made any vigorous exertion. At times she suffered much from headaches, chiefly in the parietal regions.

On examining the abdomen I found the right iliac and lumbar regions distended and tympanitic, while on the left side a tumour could be felt, half of which projected below the interspinous line. A little manipulation brought this mass to occupy the proper position of the left kidney. I now learned that after walking about the patient used to suffer from frequency of micturition, only a small quantity being voided, then copious urination would take place. Traces of albumen were found in the urine.

The diagnosis made was that this tumour was a displaced kidney, which became enlarged owing to its abnormal position.

Operation.—Feeling that it might be necessary to drain the kidney, I operated by a lumbar incision, running obliquely midway between the ribs and crest of ilium, and extending well forwards.

On reaching the organ it was found almost purple in colour, once and a half the normal size; the capsule was dense, as I found on passing an exploring needle into the renal substance; there was no nodulation, nor were there any points of fluctuation. Looking upon the condition as one of extreme congestion and œdema, due to malposition, I relieved engorgement by free incision into the cortex. A strong silk suture was now passed through the aponeurosis in front of the quadratus lumborum, and then through the fibrous capsule of the postero-external aspect of the kidney, thereby fixing that organ in a good position. A drainage tube was now laid in, and the operation completed. For some days after the operation there was distressing sickness and headache, but ten days after this the wound was healed, the oozing of serum and urine which lasted for some days having ceased.

I call attention to this case because a simple procedure has completely and permanently relieved this girl from a very annoying trouble, and it illustrates the value of dealing with these organs on the general principle that relief of tension is the essential in the treatment of congestive and inflammatory conditions.

I do not wish to be taken as advocating cortical incision or nephrorrhaphy for every floating kidney, nor do I hold with those who explore this organ every time they come across it enlarged or movable. Visual examination and direct touch are very good at times, but they should not take the place of simpler yet effective methods, and no circumstances can justify exposure of our patients to the dangers attendant on renal exploration, until all other methods have been tried without avail. Apart from the dangers arising from sepsis, and from the lethal phlebitis to which this operation exposes the patient, there are other, less widely recognised, but nevertheless very real, mishaps attendant on these procedures. One of these was well shown in a specimen demonstrated at the last Congress of German Surgeons by Barth. There was a necrotic centre found in the kidney owing to the occlusion of one of the arterial arches by the

anchoring suture. A similar condition has been noted as the result of puncture. One of the large arteries is obstructed, hæmorrhagic infarction takes place, and ultimately necrosis. With these evidences of danger before my mind, and the frequent failures to afford relief after the most promising operations, I am far from being an advocate of the indiscriminate tampering with the kidney which is now fashionable.

NEPHRECTOMY.

Case II.—E. K., aged twenty-two years, was sent to me by Dr. Fitzmaurice, of Tralee, on August 20th, 1892. The chief cause of complaint she had was that her neighbours thought she was pregnant, and, being unwed, this idea was repugnant to her. On examining her I found what appeared to be a large ovarian tumour occupying the left iliac and the umbilical regions. It was elastic, painless, and movable. The left lower ribs were drawn towards the middle line, and dulness extended up to them. On examining the pelvic organs I found the uterus prolapsed slightly, but uninfluenced by the movements of the tumour, while on suspending the patient by the knees the tumour slipped upwards with a peculiar click, best heard over the lower ribs on the left side. In this position bimanual examination showed that the broad ligaments and ovaries were free of the tumour, and on pressing forward the tissues of the loin a resisting mass was felt as the tumour had slipped into the left side to occupy the site of its original location. I need not detail the history further. Operation was decided on, but delayed in the hope that the patient's attendant, Dr. Fitzmaurice, might come to town, as he expressed a wish to assist, and I much desired his presence. Some days after, however, the patient became weaker, and I was obliged to operate. Assisted by my colleague, Mr. Tobin, I opened the abdomen in the left linea semilunaris. The incision, owing to the size and solidity of the tumour, was made five inches in length. The peritoneum being opened, I passed my hand into the right loin to find there a kidney somewhat enlarged, but otherwise normal to touch. I now laid open the peritoneal covering of the tumour outside the descending colon, and pushing it with the inner layer of meso-colon inwards, isolated the vessels which I double ligatured and divided. As the tumour projected towards the pelvis I did not attempt

ligature and section of the ureter until I had isolated the entire mass. Sponge pressure broke down most of the adhesions, only half a dozen ligatures being necessary for vascular bands at the upper and inner aspect of the growth. At this stage of the procedure an unfortunate accident happened. While engaged in detaching the tumour behind, I felt a great splutter of jelly-like material against my arm, which overlay the tumour, and Mr. Tobin, who was assisting me, called my attention to the fact that a rent had occurred in the wall of the tumour, through which grumous masses and blood tumbled out in great amount. Fearing that there was still some free blood-supply to the tumour, I rapidly turned out of its interior all the movable matter and blood I could find. I grasped the edges of the rent, pulled them well out of the wound, and encircled them (so as to close the opening) with a gauze bandage. While this was being done Mr. Tobin kept the descending colon supported against the abdominal wall, and thus prevented soiling of the peritoneum. Soon the great mass was entirely removed after ligature and section of the ureter. Satisfying myself that no infection of the peritoneum or loin occurred during the operation, I closed the peritoneal cavity. Then I dropped the ureter, completely closed the skin wound, and made no lumbar drain opening. The operation was necessarily protracted and it was some hours before the patient rallied. Then a time of quiet progress, which promised well for the patient, succeeded; but on the fifth day a rise of temperature with some shivering was noted. This was followed on the sixth by a fall of temperature and a discharge of pus in the urine. At first I feared that the remaining kidney was at fault; but careful observation of the urine after washing out the bladder showed that the discharge of pus was intermitting, and, moreover, that the urine excreted at other times was sp. gr. 1023, and contained neither albumen, blood, nor pus. This satisfied me that, so far as the right kidney was concerned, things were satisfactory. The flat abdomen and absence of vomiting or umbilical uneasiness, showed that the peritoneum was safe. Evacuation of the bowels occurred regularly from the third day. With these data to go on, I made an incision above the crest of the ilium, and passed my finger downwards and inwards towards the point at which the ureter should lie, and gave exit to a considerable quantity of dark fœtid pus. On exploring the neighbourhood, I came upon the cause of the distressing complication above noted. A small piece of sponge,

which had been placed under the ureter during section, had remained in the wound. On removing it, fully 1½ inches of the ureter came away as a slough. A short strong tube was placed in the wound after flushing with 1 to 2000 corrosive sublimate solution.

For some days the urine contained traces of pus; the dressings were saturated with the same material; but in a short time she returned to Tralee in sound health, a condition which I am happy to say continues.

My reason for detailing at such length a case of such ordinary character is to warn others against a habit which I contracted before I commenced abdominal surgery, and that is to cut or tear sponges so as to conveniently adapt them to irregularities such as occur in the axilla, groin, &c. In this case when I called for a small sponge to place under the ureter, someone, following the bad example which I had so often given, tore a piece from a large sponge, and this was placed under the ureter before division. As the great cavity from which I removed the tumour was packed with sponges to prevent oozing during the final steps of the operation, I overlooked the small piece in their removal. The sponges counted all right, and it was only when grave symptoms set in that I discovered the piece of sponge as detailed above. Since that time I have conducted or assisted at over 50 laparotomies, and I have repeated time and again—"Never tear or cut a sponge during operation."

There are some points in the operation to which I wish to refer particularly.

(*a*). *Line of Incision.*—A cursory reference to the literature of this subject shows that there is great diversity of opinion as to the proper route to follow. In a recent American work (Kean and Whyte, 794) a statement is made which is not in accordance with the views of most operators in these countries—it is that, "Lumbar incisions are to be preferred except in neoplasms of large size." While Robert

Abbe, another American, says, "The peritoneum will not be opened unless the tumour be large, and then it is better so." Both of these writers, and many others I could mention, seem to overlook the real position of those who advocate the abdominal incision. The greater freedom of action it ensures, the greater readiness with which ligatures can be applied to the renal vessels, are minor points in comparison to the opportunity it affords us of determining the condition of the opposite kidney before removing the affected one. The strongest point urged by Thornton in support of the abdominal operation is disregarded by these writers. To watch the flow through the ureters with a cystoscope, to catheterise them, or to occlude them by any of the appliances recommended for this purpose sounds well, but works badly, and none of these procedures yields anything like the information derived from transperitoneal touch.

For my part, I shall continue to cut down through the semi-lunar line whenever I contemplate removal of the kidney:—1st. Because the depth of the abdominal wall is less here than elsewhere. 2nd. You come directly down on the renal vessels through this incision. 3rd. Examination of the opposite renal region is easily carried out. 4th. The ureter can be readily followed downwards to the bladder in case it is sacculated, or otherwise so affected that removal is necessary.

The statement by Tait, that "the kidney is best reached by the most likely looking road," only proves that he is disposed to generalise once he leaves the utero-ovarian area.

(*b*). *Ligature of Vessels.*—This operation is still in its infancy, and so other details may fairly be discussed; and one which, in my estimation, demands full consideration is the method of dealing with the renal vessels.

In the accompanying photograph are shown the chief

lines of incision, the names appended being those of strong advocates or originators of the different methods shown.

LINES OF INCISION FOR NEPHRECTOMY.

A Linea alba.
B Linea semilunaris.—Thornton.
C Costo-iliac.
D Lumbo-abdominal flap.—König.
E Sub-costal oblique.—Kümel.
F Lumbo-abdominal, transverse.—Abbe.

It may seem to many that there can be nothing to discuss in reference to this matter, and yet in the most recent communication on this subject I find a surgeon of wide experience describe the steps of a case of nephrectomy in which very copious hæmorrhage occurred during the enucleation of the tumour; *but the final step of the operation was double ligature of the renal vessels.* The patient died of shock some hours after operation. Old age, low vitality, and weak heart may have aided the collapse; but the cause of death

was failure to ligate the pedicle before separating the tumour from its bed. Worse than this, there are cases on record where traction has torn through the large veins, causing such hæmorrhage that death was almost immediate; and I have before me as I write this the records of a case in which a large tumour was torn away entirely without any ligature having been applied. Clamp forceps prevented immediate death, but 14 hours later the patient succumbed. With these instances fresh in one's mind, the advantages of this early double ligature and section cannot be overlooked. 1st. You avoid all traction on the large and often very weak renal veins; 2nd. Rapid shelling out of the tumour is rendered safe; 3rd. Should hæmorrhage occur, it will be from such situations that clip forceps may be safely applied; and 4th. After removal of the tumour, sponge pressure and tamponing with iodoform gauze will effectually check bleeding. I may be told that the kidney must be removed once ligature and section of the pedicle have been carried out; but this is not so, for if the adhesions are so intimate and vascular that removal seems exceptionally hazardous, acute necrosis is unlikely to occur should the operation be abandoned. Rare, indeed, will be the occasions on which the practicability of excision or otherwise cannot be ascertained beforehand.

In my last two cases I applied the ligature before enucleating the kidney, once I satisfied myself that the organ could be removed. I raised the colon and inner layer of meso-colon inwards, and passed the ligature with a large blunt needle, such as is in use for transfixing the broad ligament in cases of ruptured tubal pregnancy.

(*c.*) *Catch Forceps.*—I have long felt the necessity for great care in the use of clip forceps in the neighbourhood of large veins. When the flow of dark blood from the bottom of the pelvis, or the loin, is appalling, one instinctively grasps a pressure forceps. I hesitate before using it, since

it has been my lot to witness the ill effects of such appliances on more than one occasion. I have seen the vessel from which a clip forceps has been removed commence bleeding when reaction sets in, and on examining the piece after double ligature and excision I have found the inner and middle coats retracted, leaving only a fenestrated web over the part which had been vigorously pinched by the forceps. Through this blood had welled up freely.

In another instance I have seen fatal hæmorrhage follow the application of a clip to a large vein, while the instances of pelvic phlebitis following crushing of the uterine veins with clamp forceps are not by any means few.

(*d.*) *Closure of the Peritoneum.*—For my part, I would advise this to be carried out always, but I should insist on it—1st, when the tumour is malignant, or contains infectious matter; 2nd, when from any cause lumbar drainage is necessary; 3rd, when the ureter is not drawn into the lower angle of the wound; 4th, when there is any tendency to prolapse of the colon.

Now, it must be borne in mind that suture of the peritoneum need not drag upon the colon if the incision has been properly made in that membrane. Even as I recommend this, I have in my mind the unfortunate but instructive case in which Thornton kinked the large intestine by suturing the rent in the peritoneum, thus bringing about a fatal result. I hold that no such sharp flexure should arise from the suturing.

(*e.*) *Treatment of Ureter.*—The ureter may be left until the tumour is turned out unless it be decidedly friable. Section of the veins allows hæmorrhage from the tumour unless they are double ligatured, but section of the ureter might infect the wound, and so it is best left until the tissues round it can be protected by sponges wrung out of corrosive sublimate solution. The material I use for all

ligatures of vessels is twisted silk, boiled and immersed in 1-1000 corrosive sublimate solution. It does not slip, it runs easily, and it is thoroughly aseptic.

In the case I have brought before you simple ligature and dropping of the ureter was followed by the formation of pus; the small sponge which was left in was aseptic, and would have become encapsuled but for the presence of micro-organisms in the mouth of the ureter. In my early ovariotomies suppuration took place in the region of the cut end of the Fallopian tube. To prevent this I have in all recent ones drawn out the mucous lining, snipped it off deep down, and applied corrosive sublimate solution 1-1000 to the stump, with a piece of alembroth gauze. Now I never see any evidence of local infection. This I shall in future do with the ureter. Thornton prefers to bring the ureter into the lower angle of the wound (semilunar line), others make a lumbar opening, through which they draw it out and fix it; while I see by a recent communication that good results have been obtained by cauterising and dropping the ureter (Richardson, *Annals of Surg.*, July, pp. 93-101).

(*f.*) *Partial Removal.*—A communication which I have received from one of the most skilled and elegant operators of our time, and to which I refer in the table of nephrectomies which I now lay before you, has caused me to refer, in passing, to the question of Resection of the Kidney. Abbe (*Annals Surg.*, 66, Nov., 1893), after detailing a case of removal of part of the kidney, says:—"No similar case to this has been reported." I should hope that few attempts of this kind will be made, as there is no means of determining the limit of cancerous invasion. Kümel, after experimenting on animals, operated on the human subject, removing successfully one-third of the renal substance for abscess and calculus, and one-half in a case of echinococcus. A third case in which he operated died ten weeks later from

interstitial nephritis, and on examining the kidney little or no trace of the operation was found. In all these cases fixation to the abdominal wall and tamponing with iodoform gauze was necessary. There are now recorded some 13 cases, with 2 deaths—one from hæmorrhage in a case of cancer, another from thrombosis of the cava; all the others made a permanent recovery. This operation should save many a kidney; and I have no doubt but that further experience will show that it is a procedure of less gravity than complete removal of the organ.

(*g.*) *Sarcomata in Children.*—Everyone knows that sarcoma in the adult should be removed if causing pain, great pressure symptoms, or, what is rare, copious hæmorrhages, but Bland Sutton ("Tumours, Innocent and Malignant," 1893, p. 120), speaking of this affection in children, says: "Nephrectomy for renal sarcoma in children is absolutely unavailing, and is fast falling into disfavour." This is a sweeping statement, and although the only case in which I performed nephrectomy for sarcoma in a child bears out his view, as recurrence took place four months after operation, I am far from agreeing with the view that every case of renal sarcoma in children is beyond the reach of surgery; and the successful cases reported by Abbe and Malcolm should, in the absence of voluminous statistics of an opposite character, make us hesitate before accepting as gospel a view supported even by 21 successive failures.

With the approval of the author of this work I transfer this collection, and to it add such cases as I could find, thus bringing the number up to 26. Even if only one of these cases is completely restored to health, the operation is justifiable, but when we find that 20 per cent. of all cases recovered and remained well after the procedure, I think it unreasonable to condemn an undertaking of which we have as yet very little experience.

Operations for Renal Sarcomata in Children under Six Years of Age.

Reporter	Age	Result of Operation	Reference
Ollier	4½ years	D.	Révue de Chir., 1883, 898
Jessop	2¼ years	R. Recurrence and death in 9 mths.	Lancet, 1877. Vol. I., 889
Kocher	2½ years	D.	Deut. Zeitsch. für Chir., Bd. IX., 312
Czerny	11 months	D.	Deut. med. Wochensch, 1881, No. XXXI., 422
Hueter	4 years	D.	Deut. Zeitsch. für Chir., Bd. IX., 527
Croft	2 years	R. Recurrence and death within a yr.	Trans. Path. Soc., Vol. XXXVI., 274
Gödlee	1 yr. 10 mths.	R. Recurrence and death in 6 mths.	Trans. Clin. Soc., Vol. XVIII., 31
Meredith	4 years	D.	Brit. Med. Jour., 1884, Vol. II., 863
Owen	10 months	D.	Cat. Mus. St. Mary's Hsptl., 1891
Pughe	2 yrs. 4 mths.	D.	Trans. Path. Soc., Vol. XXXI.
Alsberg	5 years	R. Recurrence, death in 11 weeks	Deut. med. Wochensch., 1887, 873
Rawdon	1 yr. 9 mths.	D.	Liverpool Med. Chir. Jour., Vol. III., 252
Taylor	1 yr. 8 mths.	D.	Am. Jour. Med. Sci., 1887, 470
Brokaw	3 yrs. 8 mths.	R. Rec., and death 2 months later	Phil. Med. News, 1881, Vol. LVIII., 313
B. Sutton	1 yr. 6 mths.	D.	Unpublished
A. Czerny	3½ years	D.	Arch. für Kinderkrank., Bd. XI., 247
König	6 years	R. Rec., death in 5 months	Deut. Zeitsch. für Chir., Bd. XXIX., 590
König	2 years	R. Rec., in 3½ mths.	Deut. Zeitsch. für Chir., Bd. XXIX., 590
König	1 yr. 3 mths.	D.	Deut. Zeitsch. für Chir., Bd. XXIX., 590
Fischer	4½ years	R. Rec., and death in 4 months	Deut. Zeitsch. für Chir., Bd. XXIX., 590
Walsham	10 months	R. Rec. within 12 months	Brit. Med. Journal, 1893, Vol. I., 694
Abbe	2 years	Perfect health 1½ year after	Annals of Surgery, Jan., 1894
Abbe	14 months	Perfect 1 year after	Ibid
M'Ardle	20 months	Recurrence in 4th month, death within 7 months of operation	Dub. Jour. Med. Science, 1894
Malcolm	23 months	Perfect health after 14 months	Lancet, Feb. 3, 1894
M. Hicguet	4 years	Perfect health 6 months after	Bull. de l'Acad. Royale Belg., 1882, p. 41

Nephrectomies in Ireland.

Operator	Age of Patient	Condition of Kidney, Size, &c.	Method of Operation	When and Where Recorded	Result	
					Immediate	Secondary
F. J. O'Reilly (Trim)	26 years	Scrofulous, 8½ oz. - - -	Lumbar -	Trans. Acad. Med. Ireland, Vol. I.	Death from shock	—
K. Franks -	29 years	Abscess cavities - - -	Lumbar -	1887	Good - -	Good
F. T. Heuston	14 years	Scrofulous - - -	Lumbar -	1887	Good - -	Good
K. Franks -	21 years	Tubercular - - -	Lumbar -	1889	Death from co-existing pelvic cellulitis	—
C. Coppinger	26 years	Tuberculous - - -	Linea semi-lunaris	—	Good - -	Died of phthisis 3 months later
K. Franks -	24 years	Cystic, weighed over 2 lbs. -	Abdominal	1890	Good - -	Cure
W. J. Smyly -	20 years	Scrofulous, size of fœtal head -	Lumbar -	1891	Good - -	Good
J. Lentaigne -	40 years	Abscess of kidney - -	—	—	Good - -	Good
W. J. Smyly -	33 years	Hydronephrosis, size of adult head	Abdominal semilunar line	1892	Good - -	Good
J. M'Ardle -	22 years	Cystic tumour, weighed 7 lbs., simulated large ovarian tumour	Abdominal semilunar line	1892	Good - -	Now in perfect health
J. M'Ardle -	20 months	Myo-sarcoma, filled greater part of abdomen	Abdominal semilunar line	1893	Good - -	Recurrence four months after; death within 7th month of operation
C. Coppinger	F. 53 years	Carcinoma, size of ostrich egg -	Abdominal	—	Fistula for one month	Good

These are the points to which I desire to call attention; but before concluding this communication I wish to call attention to the position of Renal Surgery in Ireland.

The table which I now present includes, I hope, all the cases of nephrectomy carried out in this country, and I take this opportunity of publicly thanking those busy practitioners who, in the rush of work, were kind enough to fill up the cards I took the liberty of sending in search of such information as would, I thought, render more interesting my communication. The number, though small, is very encouraging, as the results show that care was exercised in the selection of cases, and great skill displayed in dealing with them. If the record but tends to prove to such as are not themselves engaged in operative surgery, that the very gravest lesions of the kidney may be successfully dealt with by nephrectomy, my effort will not have been in vain, and it is my hope that those who have so gracefully assisted me in bringing forward this question may reap their reward in having more frequent opportunities for a display of that genius which keeps Irish surgery in the honoured position which it holds.

Mr. Wheeler stated that he had performed nephrectomy in 10 cases, 2 of which ended fatally, while the others recovered. He considered that in most cases the anterior incision was the best, as it was the easiest, and obviated a danger which sometimes is present—namely, the risk of tearing the inferior vena cava. He recollected a case of horse-shoe kidney in which, *post-mortem*, both kidneys were found healthy, while the connecting band contained two calculi. In this case a lumbar incision would have been useless. With regard to the oozing of blood which sometimes occurred after removal of the kidney, he found that *hot* sponges were sometimes effectual in stopping it.

Sir William Stokes narrated the case of a woman with what was probably a large tuberculous abscess in the right kidney, on

whom he had operated, making an anterior incision. He found dense adhesions all over the swelling, and these caused a great deal of trouble to break down. If he had adopted the lumbar incision it would have been impossible to remove the organ.

Mr. Tobin pointed out an accident which he had actually seen take place when the lumbar incision was made—namely, opening of the pleural sac and consequent collapse of one lung. He thought that in many cases it was well to make a counter opening for drainage in the loin when the anterior incision was the one by which the operation was performed.

Dr. A. J. Smith compared the treatment of the ureter to that of the Fallopian tube in cases of pyosalpinx. In these cases the mucous membrane was dissected off the interior of the tube for some distance and removed, and then the lips of the remaining coats inverted and the opening "topstitched." He recommended the adoption of a similar method for the ureter. He also said that clip forceps were not used nearly so much at present in abdominal operations as formerly. Vessels were now ligatured at once.

Mr. Kendal Franks briefly narrated three cases on whom he had done this operation. The first was a case of multiple abscesses in a kidney from which he had a year previously removed a soft phosphatic calculus. The patient recovered and is now quite well. The operation was done in 1887. His second case—a girl affected with scrofulous renal disease—died. At the autopsy it was found that the other kidney was extensively diseased, and that there was extensive suppurative pelvic cellulitis. The third case was that of an enormous multiple cystic condition of the kidney. It would have been impossible to remove it except by an anterior incision on account of its size. The visceral peritoneum was stripped off the anterior surface of the kidney, the organ, which weighed two pounds, was enucleated, and then the edges of the posterior layer of the peritoneum were accurately sewed together. In this case he made a counter opening in the loin for drainage. Referring to Mr. M'Ardle's first case, he pointed out that many patients who were treated for indigestion, dyspepsia, and such like troubles, accompanied by pain relieved on lying down, really suffered from a movable kidney. In one case on which he operated he found that the kidney, by dragging on the duodenum, obliterated its lumen.

Mr. Thomson pointed out that it was sometimes very difficult

to tell whether the second kidney was healthy, even when you could feel it. He had assisted at an operation for renal calculus in which an anterior incision was made. The operator examined the other kidney, but at the *post-mortem* examination calculous masses were also found in it. He thought it was wise in some cases to make a counter opening in the loin for drainage. He recommended inversion of the edges of the ureter, and closure by stitches. He thought that cases of sarcomatous kidneys in young children were better left alone. The result list of cases operated on was very dismal to read over.

Mr. M'Ardle, in replying, stated that he considered the anterior incision best, except where there was perinephric suppuration. A counter opening in the loin was advisable where there was any soiling of the lumbar tissues, and where free oozing of blood required tamponing. A moderate amount of blood lodging in the site of the tumour, if strict asepsis was carried out, made very little matter. With regard to sarcomata in the kidney, he thought that if they even succeeded in saving four lives out of twenty-six they ought to operate.

SUTURE OF SCIATIC NERVE.

By J. DALLAS PRATT, M.A., M.D., B.Ch. (Dub. Univ.);
Fellow of the Royal College of Surgeons;
Surgeon to Jervis-street Hospital.

[Read before the Section of Surgery, March 30, 1894.]

The case which I submit is one which I consider to be of very great interest—first, because it is, so far as I can find out, one of very great rarity, and, secondly, because the result of the operative measures adopted has been so successful:—

Case.—J. C., a fitter, aged sixteen years, a delicate-looking youth, small for his age, and badly nourished, was admitted to Jervis-street Hospital on the 10th of February, 1892. He was suffering from a very large lacerated wound of the right thigh. He came to hospital at about 8 o'clock, a.m. The wound was situated on the right limb close to the fold of the nates, and was at right angles to the long axis of the leg; it was quite six or seven inches in length, and extended from nearly the middle line on the inside, to within a short distance of the middle line on the outside. All the structures at the back of the thigh were divided down to the femur, including the great sciatic nerve; the wound gaped to the extent of at least five inches. It had been inflicted about two hours before I saw him, in the following manner:—The workshop in which he was had a large horizontal shaft on which were a number of pulleys driving machinery. He proceeded along a girder, to put a belt on one of these whilst it was in motion. It so happened that the particular pulley had a piece broken out of the rim; in trying to put on the belt it caught him and threw him against the pulley, and he became wedged between the revolving edge and the girder. The former with the bit out was practically a circular saw, and before the engine could be stopped the wheel had cut through the back of his thigh making the wound already described. In addition to this a quantity of machine black, lubricant, and portions of clothing were ground into the wound. There was comparatively little pain and no hæmorrhage. I at

once had him put under the influence of an anæsthetic (ether) in the operating room, and proceeded to clean out the wound with warm carbolic lotion (1 in 40). The removal of all the extraneous matter was a task of great difficulty and required some time. I next looked for the ends of the divided nerve and found them in a very lacerated condition, so much so that I was obliged to remove nearly half an inch of each in order to get a clean and solid surface to suture. Of course when this was done the ends did not come together, so I stretched first one and then the other until they came together without tension. They were then united by means of three sutures of fine carbolised silk used in a small needle—two of these were passed through the sheath of the nerve one on each side, the third through the substance of it in the centre. In the case of all six punctures, the distance from the cut end of them was about a quarter of an inch. I next sutured all the muscles with the same material and brought the skin together by means of hare-lip pins. Having dusted all the surfaces with iodoform, the whole was then dressed with alembroth gauze. The thigh was extended and the leg flexed as much as possible and fixed in that position on a splint.

Feb. 13th.—Temperature, 101° F.; the patient was in some pain, but the wound which was dressed looked well.

14th.—Temperature, 100° F.

16th.—Temperature, 99° F.

From this time the patient made a good recovery, the only complication he had being a small number of trophic ulcers on his toes; these, however, healed without much trouble, and by the 1st of March the wound was reduced to a superficial ulcer.

By May 1st he had recovered the use of his limb sufficiently to be able to walk fairly well. He left hospital on the 8th of May with fairly good use of his leg, he had also got back the sensation in all parts of the limb except the dorsum of the foot and toes.

Suture of nerves may for convenience be divided into primary and secondary; I will, however, confine the few remarks I have to make to the former class of cases, on which the present one bears more closely. Although the idea of the repair of divided nerve trunks was considered by Galen, it was in his time and for long after rejected as quite an impossibility. It was not until 1795 that Haighton

and Cruikshank, who made experiments on dogs, showed that if one pneumogastric nerve be divided and the dog kept alive for a certain time, section of the other would not cause death, though simultaneous section of both was always fatal. This they considered satisfactory proof that regeneration of the nerve first divided had taken place.

The result of these experiments was an idea that all cut nerves underwent regeneration without any treatment of any kind, and this view appears to have been looked on as correct and satisfactory down to 1852, when Waller made further investigations which tended to show that the peripheral ends of divided nerves underwent degeneration, and that it required several months to effect repair. There appear to have been cases where divided nerves are said to have been sutured in the middle ages, but they are not authentic. Dupuytren did the operation more than once, and it is reported to have been done previously, in 1826 by Arnamann, and in 1828 by Flourens. Apparently the great fear of tetanus from any interference with nerves, and the still existent idea that all cut nerves would unite without treatment, deterred others from suturing them. A case of primary suture of the median nerve took place in France in 1864, and primary union was claimed. In 1865, Landois made a number of experiments which went to show that both of the divided ends degenerated, and he therefore argued that there could be no use at all in suture.

The result of all later experience shows that there is little or no special danger in suturing nerves, and that the patients have a much better chance of a favourable result than they would without stitching. With regard to the mode of operating, it was formerly held that the suture should in all cases be passed only through the sheath, and never through the substance of the nerve, lest some nerve irritation should be set up. This appears an error. Suture of the sheath alone

may be sufficient in the case of small nerves, but in the larger ones might fail to bring the ends properly into position. The really important point is to pass the sutures through at a distance of quite a quarter of an inch from the cut surface.

With regard to the material for suture, catgut has been used in the majority of cases, and is probably the best for small trunks. For larger ones, or where there is any unusual tension, it is better to use something harder. Mr. Bowlby prefers chromatised gut or kangaroo tendon. The silk, however, seemed to answer all purposes in my case. The last-named writer thinks it best to pass, in the case of large nerves at all events, the third suture through the trunk in a direction at right angles to that of the other two. This was not found to be necessary in the present case.

Up to 1885 Mr. Bowlby had collected 81 cases of primary nerve suture, of which 32 were successful, 12 doubtful, 22 partially successful, 14 failures, and 1 the result of which was not stated.

Of all these only one was the great sciatic, and as it was only under observation for thirteen days the result is, I suppose, one of the doubtfuls. Mr. Bowlby also informs me that since 1885 he has not had, or heard of, a similar case to mine.

Park, of Chicago, described, in 1884, a case of rupture of the sciatic nerve with restoration of function.

The special feature in the present case was the removal of so much as an inch of so large a nerve trunk, and this, owing to the lacerated state of the ends, was unavoidable. I might, then, instead of stretching the nerve, have, as is recommended by some, made a transverse incision half through the thickness of the trunk, at some distance from the cut end, and then split the nerve from that point almost to the end, turning the piece so separated round and suturing

it to the other end, or to a similarly separated portion; but it seemed to me a much more simple and rational plan to approximate the ends by stretching, and one that I judged would give the patient a better chance of a good result.

Mr. Myles said that he did not consider this case absolutely successful. The injury occurred two years ago, and regeneration, if it were to take place, should have done so by this time. Restoration of cutaneous sensibility alone was a fallacious test owing to the existence of recurrent sensibility through the union of nerve filaments of the divided nerve with filaments of intact nerves. He had treated a man who had all the structures in the front of the wrist, with the exception of the tendon of the flexor longus pollicis, severed, in whom he sutured the ends of the median and ulnar nerves. In a few days the man had partial sensation in the area supplied by the median, and this he attributed to communications between the radial nerve and the palmar cutaneous branches of the median. In the region supplied by the ulnar nerve sensation was never restored, neither was the muscular power ever regained, and the interosseous spaces wasted and remained so. He had been extremely careful to bring the divided ends in accurate apposition and to secure them by numerous fine sutures through the nerve-sheaths. In two other cases in which he had operated—one a boy whose anterior tibial was severed, and another a patient who sustained a compound fracture in the neighbourhood of the elbow—muscular power was never regained.

Dr. Brooks said that in Mr. Pratt's case he thought the restoration of sensibility was through the great sciatic nerve. In the hand there was a considerable area of skin which had a double nerve supply. Adjoining nerves invaded each other's territory. This was not so in the case of the foot. The long saphenous nerve—the only cutaneous nerve in that region not derived from the great sciatic—supplied a small area of skin just beneath the internal malleolus, and he had never been able to trace it along the inner side of the foot to the great toe. He mentioned a case recorded by Surgeon Yenkith in the *British Medical Journal* of a soldier whose ulnar nerve was divided above the wrist. Several months afterwards the ends of the divided nerve were brought

together, and sensation, which had been completely lost in the little finger and part of the ring finger, returned.

Mr. Wheeler called attention to a case recorded by Mr. Wheelhouse of recovery of muscular power and sensation after division of the great sciatic and subsequent suture of the ends. He narrated a remarkable case of an officer whose musculo-spiral nerve was cut, and several months afterwards, on cutting down on the nerve, the ends were found widely separated and unable to be brought together. By the advice of the late Mr. Corley he divided the shaft of the humerus and resected a portion of it, and was then able to bring the ends of the nerve together. Recovery was perfect in every respect as regards power and sensation.

Mr. Pratt, in reply, said that cases of primary nerve suture immediately after receipt of the injury were, as a rule, much more successful than suturing the ends together some months later.

THREE CASES OF POPLITEAL ANEURYSM.

By J. V. LENTAIGNE, F.R.C.S.;
Surgeon, Mater Misericordiæ Hospital.

[Read in the Section of Surgery, March 30, 1894.]

THE three cases of popliteal aneurysm, which I am about to detail, have some points of special interest which made me think it worth while to bring them under your notice. The first came under my observation seven years ago, and the other two within the following twelve months. I delayed publishing them, as I naturally hoped and expected that when I had had three cases of this comparatively rare disease under my care within a period of twelve months, I might in a few years be able to record a fairly large series of cases which might be of considerable interest. In this, however, I have been disappointed; these three cases are the only cases of popliteal aneurysm I have ever had under my care, and I now bring them forward before the details have passed from my memory.

CASE I.—P. H., aged twenty-three, van-driver, a strong, healthy-looking young man, was admitted into the Mater Misericordiæ Hospital, suffering from left popliteal aneurysm. The tumour was about the size of a large orange, and was tense and hard, with a well-marked pulsation. Patient complained of suffering great pain, especially when trying to walk. He said that the trouble had commenced quite suddenly; six weeks before, on jumping off a van, he felt a sharp pain in the knee, and a few days after had noticed the tumour, which had rapidly increased in size up to date of admission. There was no history of syphilis. Patient was at once put on suitable diet, and kept in bed, and treatment by compression was begun at once. After a few days the patient, who was extremely irritable, complained that the instruments were too painful, and refused to allow them to be applied any more. An

effort was then made to treat the case by digital compression, relays of students being told off to keep up the pressure in the usual way. This was found to be even more painful than the instrument, and finally had to be abandoned, the patient announcing his intention to have his femoral artery ligatured. He had been listening attentively to the clinical lectures on his case, and had come to the conclusion that such an operation was the only thing for him. I made an effort to treat the disease by flexion, but this also was defeated by the extreme irritability of the patient, who positively refused to allow anything else to be done except the operation, and as the tumour was undoubtedly increasing in size, and as the circulation in the foot was beginning to show signs of obstruction to the venous trunk, I performed the operation of ligature of the superficial femoral at the apex of Scarpa's triangle on May 3rd. The artery was tied with stout catgut, and the wound was drained by a decalcified bone drainage tube, and dressed with turf dressing. Pulsation ceased at once in the tumour, and never returned, and after four weeks the patient was allowed up.

He left the hospital on June 19th. The tumour could still be felt, but was like a small, hard apple; it was quite pulseless. Six months after the patient was shown at the Surgical Section of the Academy; he was then quite well, and the tumour could not be felt at all.

Case II.—T. R., aged thirty-eight, law clerk, was admitted to the Mater Hospital on May 16th, 1889, suffering from left popliteal aneurysm of one year's duration. The aneurysm was a very large one, completely filling the ham, and extending up into the back of the thigh. Shortly after admission it was discovered that the patient had a loud and well marked double aortic murmur.

In this case also treatment by compression was begun, but was soon rejected by the patient, who was encouraged in his rebellion by the patient whose case I have already detailed, and who was in the same ward with him. I then tried treatment by flexion by means of a strap from above ankle to a belt round hips. This was done without complaint for some days, but was removed by me on my finding a patch of gangrene a little larger than a crown piece at the spot where the strap pressed on the front of the tibia, just above the ankle.

On May 23rd I ligatured the superficial femoral, the patient

being under ether, which was well taken. There was nothing special about the operation, which was almost precisely similar to that in the previous case. The day after operation a slight pulsation was noticed in the tumour; this lasted for forty-eight hours, and then ceased. On the eighth day after the operation I found that the patient's temperature had risen suddenly to 103°. The day before being Sunday (visiting day), his wife had surreptitiously brought him a bottle of sherry, the whole of which he had consumed immediately after she left, with the result that he became violently intoxicated, and perambulated up and down the ward dressed only in his nightshirt and the antiseptic dressings. He was got back to bed with much difficulty, but soon went to sleep on getting a hypodermic injection of morphia. I examined the wound, and found it quite healed; the aneurysm was hard and pulseless. I should have mentioned that in consequence of the gangrenous patch on the leg the entire limb had been bathed in carbolic lotion for some time before the operation, and after the operation the whole limb down to and including the toes was dressed in an antiseptic dressing. Under this dressing the gangrenous patch was slowly detached and cast off, and the ulcer healed absolutely without suppuration.

This patient was shown at the Surgical Section of the Academy in November. He was then perfectly well.

Case III.—J. M., aged seventy-seven, labourer, sent to me by Dr. Scott, was admitted in April, 1888, suffering from popliteal aneurysm of the right side, of two months duration. I have no notes of the previous history of this case. His state on admission was anything but encouraging. A feeble, worn-looking old man, with extensive disease of his arterial system. He was as unsatisfactory a case for treatment as could well be imagined. He complained of severe and persistent pain in the tumour, which had to be relieved by daily and nightly hypodermic injections of morphia. His femoral artery, like all the larger arteries I examined, was unduly hard, prominent, and could easily be felt almost anywhere in the limb. I could easily feel the artery as a semi-rigid tube all the way down Hunter's canal, and a distinct thrill could be felt when the artery was touched.

The condition of the patient was so bad that I had most grave doubts as to what would be the best procedure to adopt for his treatment. I had the benefit of a consultation with a very eminent

surgeon since deceased, who was examining students for one of our Universities, and was strongly advised by him to do nothing but relieve the pain, as in his opinion nothing but amputation would save the patient. He was of opinion that compression, either digital or instrumental, of the prominent and rigid artery, would be almost sure to start a fresh aneurysm at the point of compression.

After much consideration I decided to treat the case by flexion, and if this plan should fail to cure that then I should ligature the femoral artery, and could resort to amputation if these measures failed. I fitted on the strap apparatus which had been made for the last case, and here again it was worn without complaint, but the flexion never completely stopped the pulsation in the aneurysm. After two days the patient complained of pain in the front of the leg, and I was horrified to find a white patch of insensitive skin which ultimately proved to be gangrene, nearly as large as the palm of the hand over the front of the tibia where the strap had pressed against it. I removed the apparatus, and carefully soaked the dead part in corrosive sublimate lotion (1 in 1,000), and applied a permanent antiseptic dressing.

On April 27th I ligatured the femoral; the operation was to me a most anxious one. I could feel hard plates of atheroma in the artery in Scarpa's triangle, but on displacing the sartorius rather more than usual, I found the state of the vessel a little better. Although harder than normal it could easily be compressed, and there were no tangible plates to be felt in it. I used a thick catgut ligature, softened by immersion in carbolic lotion, and I then dressed the wound with wood wool and alembroth gauze, using also catgut sutures and Neuber's canalisation punch-holes for drainage. At the same time the entire limb was wrapped in an antiseptic dressing.

The progress of the case was aseptic and afebrile, though the patient suffered great pain in the tumour and in the leg for some days. This was relieved by morphia, and on March 16th I removed the dressing, and found the wound perfectly healed. No pulsation could be felt in the artery for some distance above the ligature. The aneurysm was hard, and had already much diminished in size. The gangrenous patch of skin was detached, and a clean healthy ulcer was found on the front of the leg. This was treated by boracic ointment, and was quite healed when the patient left hospital in June.

In November I wished to exhibit the patient, but on making

inquiries at his residence I was told that he and his family had gone away shortly before, and that his address was not known, and that except for a slight limp he had been apparently in his usual state of health up to the time he left.

The successful result of this last case is remarkable, considering the great age of the patient and the diseased condition of his arteries. I feel satisfied that the result would have been in every way less satisfactory if the wound had not been perfectly aseptic all through, and the same remark applies with equal force to the second case, where the patient walked about the ward and struggled violently for some time on the seventh day after the operation.

I think the great safety of ligature with antiseptic precautions as compared with the old method of procedure, justifies us in performing the operation when required much sooner and more readily than formerly. I also believe that the compression, both digital and instrumental, and especially the treatment for some days immediately before the operation by flexion, although it failed to cure the disease, greatly assisted the cure by the ligature, and also must have largely helped to prevent any extension of the gangrene, which had so quickly resulted from the pressure of the strap in two of the cases, by setting up an efficient collateral circulation around the knee-joint. It would, I think, be a wise precaution in all such cases to thoroughly asepticise the entire limb below the ligature, and to envelope it in an antiseptic dressing until the circulation be completely re-established, as otherwise the enfeebled condition of the tissues would be more likely to render them an easy prey to micro-organisms, and assist in the development of gangrene. My recollection of the frequent occurrence of gangrene in the bruised tissues in the neighbourhood of compound fractures treated by old

methods, and its almost complete disappearance under antiseptic treatment, first led me to adopt the precautions detailed above.

The PRESIDENT referred to the comparative rarity now of cases of popliteal aneurysm. He also spoke of the great improvement in the operative treatment due to the introduction of antiseptic surgery.

MR. WHEELER said he was surprised to hear that Mr. Lentaigne's patients suffered severe pain when digital compression was tried. In several cases he had seen where this treatment was tried they never complained. In a case he had under observation at present he had refrained from operating, as he noticed that the articular arteries were enlarging and establishing a collateral circulation, and this was always looked upon as a sign that the aneurysm would probably cure itself.

DR. BROOKS asked Mr. Lentaigne were the occupations of his patients such as required them frequently to assume the squatting posture, as in gardening, in which position the popliteal artery is sharply bent.

MR. MYLES said that when the leg was fully flexed the artery became tortuous, and accordingly the sharpness of the bend was lessened. He thought that Mr. Lentaigne was very fortunate in the case, in which there was extensive atheroma. He recalled the case of a man whose arteries were in a similar condition, and who sustained an injury to his brachial artery, which resulted in an aneurysm. Compression was tried without avail, but caused some cellulitis; and the artery was finally ligatured. Secondary hæmorrhage followed, requiring ligature higher up. Hæmorrhage again occurred, and the artery was again ligatured, but the patient succumbed to repeated hæmorrhages. He thought that it was doubtful whether compression antecedent to operation was of benefit.

MR. SWAN said he thought that syphilis and flexion were regarded with too much importance as causes of aneurysms. The Indians who squatted all day on their heels, and many of whose tribes were all but universally affected with syphilis, were, according to Dr. Armstrong, exempt from aneurysms.

MR. FRANKS narrated the history of a man who had a popliteal

aneurysm, and in whom, after having tried compression and flexion, he ligatured the superficial femoral artery at the apex of Scarpa's triangle. Pulsation returned in the aneurysm after some days, and he was forced to do the operation of Antyllus. The vessel was tied above and below, and the aneurysm was excised. The man a week later got dry gangrene of his foot, and he had to amputate below the knee. He was unable to understand why the latter operation caused gangrene while the former did not.

Dr. Doyle advised the use of iodide of potassium internally in cases of atheromatous arteries.

Dr. Thompson said that he thought one of the reasons Mr. Lentaigne's case of aneurysm in a subject affected with extensive atheromatous disease was so successful was owing to his having used a thick soft ligature which did not tear through the coats of the vessel.

Mr. Lentaigne, in reply to Dr. Brooks, said that the occupations followed by his patients did not necessitate much squatting. One was a vandriver, another a law clerk, and the third a labourer in Guinness' brewery.

A CASE OF NASO-PHARYNGEAL FIBROMA.

By ROBERT H. WOODS, M.B. (Dubl.), F.R.C.S.;
Throat Surgeon to the Richmond Hospital, Dublin.

[Read in the Section of Surgery, May 4, 1894.]

THE patient whose case I am about to detail is a young gentleman aged twenty-four. About May, 1888, he noticed an increasing difficulty in breathing through the left nostril, accompanied by an offensive smell, but without pain. The nostril after a while became stopped, and he then found that the right side began to be similarly affected. At this time he had frequent attacks of giddiness, his memory began to fail, and he found difficulty in concentrating his attention on any kind of work. He slept about eighteen hours out of the twenty-four, and during the remaining six was so drowsy that he could sleep at any moment. These symptoms continued with more or less constancy until he had been under my treatment for some time, when they gradually abated.

In November, 1889, being then in America, and finding his symptoms getting progressively worse, both nostrils being stopped, he consulted Dr. Isaac Barton, of Philadelphia, who examined his anterior nares and recognised a tumour in the left nostril, which, he said, was a polypus. He treated it by burning—whether with chemicals or cautery is not quite clear—but it grew faster than it was destroyed. At this time he was attacked by violent earache, which lasted a week and ceased with the discharge of a quantity of matter from the left ear

In the following month he went to Prof. Garretson, who, recognising a tumour in the posterior nares, split his soft

palate preparatory to operating from the mouth. He then applied a post-nasal forceps with the object of tearing the growth away, but only succeeded in removing a very small quantity. This operation was followed by deafness in the left ear, which lasted between two and three months.

Prof. Garretson then made a second attempt to remove the tumour by means of a wire ecraseur passed through the nose, but the wire breaking several times the attempt was abandoned. Five weeks later he applied London paste which was followed by very violent hæmorrhage for more than an hour, by which time the patient had lost such a quantity of blood that he was very weak. London paste was again applied at the end of a fortnight, and the application was again followed by hæmorrhage so considerable that he was greatly enfeebled. With the object of restoring his strength he was recommended to take short walks in the open air; this he attempted several times, but on each occasion blood began to flow before he had gone many paces. Nothing further was done for him in America.

In May, 1891, the patient returned home, still unable to use his nose for physiological purposes, and consulted Mr. Thornley Stoker, who, with the object of radical removal, submitted him to the following operation:—The ala of the left nostril was raised by a curved incision carried along the fold, and the anterior border of the superior maxilla chipped away for the purpose of getting more room. The anterior part of the tumour was gouged away, when it was found that its attachments were so extensive, and the hæmorrhage so fierce, that complete extirpation was impracticable. The bleeding was stopped by plugging.

Mr. Stoker was of opinion that the base was attached to the body of the sphenoid, basi-occiput and septum nasi.

My later observations confirm this view, but I believe it was also attached to the outer wall of the nasal fossa on the left side in the neighbourhood of the palate bone. Mr. Stoker shortly afterwards commenced a series of operations with the galvanic snare, by which he removed a considerable portion, partly through the nostril and partly from behind through the mouth. He, in addition, punctured the growth with the electro-cautery, with the object of causing it to shrivel. In January, 1892, while the patient was undergoing this treatment, Mr. Stoker transferred the case to me.

On examination I found the following conditions present:—There was little abnormal in the contour of the nose, the bridge being slightly widened. The soft palate, which lay at an abnormally low level, was split for about half an inch immediately to the left of the uvula. The whole naso-pharynx, down to the level of the soft palate, was filled with a rounded, smooth, and fixed reddish-grey tumour of cartilaginous hardness, invisible directly from the mouth, but plainly to be felt with the finger and seen with the post-rhinal mirror. It adapted itself behind and laterally to the pharynx walls, and in front to the soft palate. No pedicle could be felt, a probe passing with comparative ease between the tumour and the pharynx wall and soft palate in all directions. When looked at from the front the mucous membrane was seen to be hypertrophied on the turbinated bones, and seemed to glide into the anterior surface of the tumour, which was situated about an inch from the nostril. A probe passed into the left nostril could not be made to appear behind without using undue force. The posterior inferior segment of the left drum was occupied by a cicatrix presumably caused by the bursting of the pus above mentioned. This attack of suppurative otitis was possibly caused by the

forcing of a catarrhal discharge into the middle ear when unable to make its way past the tumour.

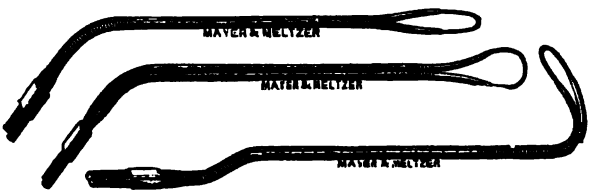
On making very violent expiratory efforts he could occasionally get a bubble of air through the right nostril, but all efforts at forcing through the left failed. Breathing was always carried on through the mouth, and the voice was entirely without nasal tone. His general health was good, he was well nourished, had lost no flesh, and had no glands engaged.

Operative treatment having been decided upon, I proceeded as follows:—Having brushed out the pharynx, soft palate, and fauces with a 20 per cent. solution of cocaïn, I tried to get an electric snare round that portion of the tumour which presented in the naso-pharynx, using iron and steel wire as commonly sold for snares, but owing to the closeness of the tumour to the naso-pharyngeal wall the wire bent with each attempt and I failed. I then tried stronger steel wire as made for the higher piano strings; this admitted of more considerable force being used without change of shape, and I was able, with a little manipulation, to pass the loop between the upper surface of the soft palate and the growth; then by forcing the snare tubes between the tumour and the posterior pharynx wall, drawing the loop tight and passing the current, I succeeded in lopping off my first piece, which equalled a filbert in size. The raw surface bled pretty freely, but otherwise nothing untoward followed.

I continued to operate in this manner between once and four times a month, getting away larger or smaller pieces, until I could no longer get the snare to take a grip. The bleeding was sometimes very considerable, but not alarming, and never required any very energetic treatment.

In May, 1892, three months after the first operation, the right nostril was quite free, his nasal tones were restored,

and he could sleep with his mouth closed—a luxury he had not enjoyed for nearly four years, The next question was how to clear the remainder of the obstruction from the left nostril. For this purpose I devised a galvanic curette, which consisted of a semicircle of platinum wire about an inch long, the ends of which were brazed into two insulated copper rods connected with the battery through the handle, the rods having the usual curve of post-nasal instruments. The arc was so arranged that the plane of the semicircle, when in position in the posterior



nares, was parallel with the basi-occiput, and by pressing it against the posterior surface high up at the base of the skull and passing the current, the heated arc buried itself in the substance of the tumour; then, on being drawn down, it ploughed a furrow, and so removed a piece of its own shape on section. In this way the whole naso-pharynx was cleared, and attention directed to the anterior nares. A very similar and specially-made platinum arc was here used. The heated arc was first passed into the tumour close to the septum in a vertical plane, then moved outwards to another plane parallel with the first and withdrawn. In this way pieces were removed, so that by November the way through the tumour from the anterior to the posterior nares was established, and it became possible to operate with the utmost nicety from the anterior nares while looking from behind through the post-rhinal mirror. The instrument was first passed through the nostril with the right hand until the platinum arc projected

well into the naso-pharynx. The mirror was then warmed and introduced through the mouth with the left, the patient himself holding the tongue depressed by a Türck's spatula. The flat side of the loop was then applied to the desired place, and on the current passing was made to sink into the tissues; then, on being withdrawn, a piece corresponding to the size of the loop fell away. In this manner the left nostril was made perfectly free by the end of December.

I continued operating until everything which could be recognised as abnormal, either from in front or behind, was removed. This was about the middle of January.

The patient is now quite well in every respect. His voice has recovered its normal nasal tone. The wound in the soft palate is not extensive enough to interfere with the closure of the posterior nares. He pronounces his labial and dental consonants perfectly, and is quite free from the abnormal feelings of which he used to complain.

The number of operations was necessarily considerable; this, however, was not an unmitigated disadvantage, for the removal of small pieces at intervals of a week or ten days must, by gradually diminishing the tumour and so the demand for blood, have brought about a diminution in the size of vessels, which, if severed in the first instance, must have bled very seriously.

As a proof that such a shrinking of the vessels really did take place, it may be mentioned that the quantity of blood lost from the operations was progressively less as the pedicle was approached, the bleeding during the last few operations being trivial.

Local anæsthesia was always induced by painting the anterior and posterior nares, soft palate, and fauces with a 20 per cent. solution of cocaïn. During and after operation through the posterior nares, the patient's suffering was almost nil, but through the anterior nares it was

sometimes considerable. The pain in the latter case was always referred to the teeth of the left upper jaw, which can be explained by assuming that the sensations received by the nasal branches of the anterior palatine nerve were referred to its alveolar distribution.

Dr. H. C. Earl, who kindly examined the tumour microscopically, reports it to be a fibroma with a few cellular spots here and there. It is now over thirteen months since the last operation, and the tumour has not recurred. We are therefore, I think, fairly entitled to call the case cured.

This case demonstrates the possibility of successfully dealing with naso-pharyngeal tumours without resorting to methods so dangerous and disfiguring as those detailed by Mr. Christopher Heath in the *British Medical Journal* of December 10th, 1892.

The successful removal of this polypus is very largely owing to the instrument which I have called the galvanic curette, and which, so far as I know, has not been used before. Without it complete removal would have been impossible without running great risks, while with its use it was to a large extent a matter of manipulation.

The following advantages may, I think, fairly be claimed for this method of operation:—

(1) The patient is neither maimed nor disfigured.

(2) The operator can see exactly what he does, so that the danger of injuring healthy structures is less, and the chances of radical removal very much greater than when working with a sharp tool in a pool of blood with only the sense of touch as a guide.

(3) There is less danger from hæmorrhage, both on account of the shrinkage of the vessels with the lessening of the tumour, and from the fact that burnt vessels bleed less than cut ones. This is a consideration of prime importance in view of the fact that death has more than

once occurred from hæmorrhage during operation by the knife and gouge.

I last saw the patient on June 5th, 1893, four months after the last operation. He was then quite well in every respect. His voice had a quite normal nasal timbre. So perfectly was it restored, in fact, that he had adopted the stage as his profession, and was then on his way to enter on an engagement at one of the leading London theatres.

Sir William Stokes congratulated Mr. Woods on his success, and said that formerly this case would have required to be treated by an operation which would have necessitated great cicatricial deformity, in which there would have been danger from hæmorrhage at the time of operation, and which would have been difficult of performance. Mr. Woods' method got rid of all these objections, and the shock to the patient was infinitely less. It seemed to him that nasal polypi were less likely to recur after removal by the galvano-cautery than after removal by other methods. Perhaps this might be due to the firm cicatrix produced by a cautery.

Mr. Swan wished to know could this method be applied to removing osseous growths.

Mr. F. A. Nixon asked Mr. Woods did he think the disappearance of the somnolence to be due to the removal of the tumour.

Mr. Maxwell said that inability of concentrating one's mind upon work is a rather common symptom in adenoid tumours occurring in the naso-pharynx. Their removal often resulted in the patient being freed from this symptom. He had occasionally noticed that patients, shortly after operation, complained of pain in the occipital region.

Mr. Myles mentioned a case in which he had assisted the late Dr. Robert M'Donnell. The patient had a recurrent growth in the naso-pharynx. It had been previously operated on by the snare, but had recurred. Dr. M'Donnell determined to try and gouge away the growth from the front. He succeeded in detaching the tumour, but the hæmorrhage was something appalling. The patient recovered, but the growth afterwards recurred, and came under the care of Mr. Thomson at the Richmond Hospital.

Mr. Thomson said that he had not much difficulty in removing

the recurrent growth when the case came under his care. The tumour was reached by splitting the nostril and raising the lip. Recurrence took place in fifteen months, and the tumour was again removed. The boy lived for two years, but he had not been able to find out what was the cause of his death. The only objection he saw to Mr. Woods' method was that it was rather a prolonged procedure. He did not think any cicatrix would prevent the recurrence of a tumour if the tumour was one of those which had a tendency to recur. By this method the disease might be more thoroughly attacked and got rid of, and this element seemed to have more to do with preventing recurrence than a firm cicatrix.

Mr. Chance wished to know would the time of treatment be shortened if a plastic operation giving greater room were first done and then Mr. Woods' instrument immediately applied.

Mr. Woods, in reply, stated that diminished likelihood of recurrence of the tumour he considered to be due to the method being more thorough. He saw no reason why the instrument should not be used to remove exostoses, particularly those in the external auditory meatus. In all cases of naso-pharyngeal tumours there existed in the patient great stupidity. The drowsiness and somnolence he considered to be this stupidity in a greater degree. With regard to Mr. Chance's suggestion, he did not think that it could be followed, because the very essential for success in the operation was that you should see exactly what you were doing. The bleeding consequent on a plastic operation would prevent this.

SECTION OF OBSTETRICS.

OPERATIVE TREATMENT OF SUCH HERNIÆ AS APPEAR THE RESULT OF CONGENITAL DEFECT OF LINEA ALBA, OR AS THE OUTCOME OF LAPAROTOMY.

By J. S. M'ARDLE, F.R.C.S.;
Surgeon to St. Vincent's Hospital, Dublin.

[Read in the Section of Obstetrics, November 24, 1893.]

The question which I desire to elicit your opinion upon, is one of great moment, not alone for the specialist, but also for workers in every department of surgery—I allude to the operative treatment of such herniæ as appear as a result of congenital defects in the linea alba, or as the outcome of laparotomy. The cases which I shall bring under your notice illustrate the course followed by both varieties prior to and after operation.

Case showing the result of Neglected Fatty Hernia from Sub-peritoneal Tissue (Lücke).

Mrs. H., aged fifty-one, came under my care on the 12th of January, 1890. For many years she had noticed a small nodule under the skin, a little above the umbilicus. Suddenly, during the lifting of a weight, she felt something giving way in the abdomen, and soon after was obliged to lie down owing to abdominal pain. On examining the neighbourhood of the original nodule, she found a swelling the size of a small orange. This soon lessened in bulk, but recurring enlargements took place, until distressed by continual protrusion she sought surgical advice, and was placed under my care, when I found a rounded tumour, dull on percussion, irregular in outline, and not reducible. Diagnosing omental hernia, I proceeded to lay open the sac after the manner I shall detail here-

after, and found not only a large omental hernia, but also a knuckle of small intestine. Replacing the loop of gut, I applied 8 or 10 fine silk ligatures to the root of the omental protrusion, placed a flat sponge underneath it, and removed a great mass of extremely dark-coloured and almost gangrenous omentum. I need not detail the remaining steps of the operation, suffice it to say the patient made an excellent recovery, all the unburied sutures being removed on the eighth day.

In this case I have no doubt but that removal of the primary fatty nodule which I found adherent to the outer side of the protruded sac, would have prevented the development of the dangerous condition which preceded operation, especially if the small opening had been closed by a buried suture or by silk-worm gut suture passed through the skin, and deeply through the revivified aponeurotic border of the ring.

Case of Enormous Umbilical Hernia with Strangulated Gut and almost Gangrenous Omentum.

Helen E. was admitted into St. Vincent's Hospital on the 8th of March, 1891, in great distress owing to a very large umbilical hernia which could be only partially reduced, and therefore no truss could be worn at the time of admission. The tumour was as large as a fœtal head. As no time was to be lost, owing to symptoms of strangulation being present, I incised the skin on the left side along a curved line, and reaching neck of sac, cleared it for a short distance, then with strong, long-handled scissors I cut clean through the tissues up and down to the ends of the skin incision. Checking hæmorrhage, which was sharp, with clip forceps, I divided the skin and all the tissues on the right side quickly with the scissors, thus freeing the entire neck. Opening the sac on the left side I found numerous firm adhesions of the omentum thereto. I did not delay to break these down or double ligature them; but unfolding the membrane, we came upon an almost gangrenous piece of intestine of considerable size. This was adherent to the sac and the omentum, and was irreducible. Most of the adhesions broke down under sponge pressure, and a slight section of the ring outside the sac allowed stretching of the neck and return of the bowel. Three circum-

stances induced me in this case to remove the omentum—1st. The numerous adhesions would require more ligaturing than the stump. 2nd. The abdomen was already as full as it could well be. 3rd. The protruded mass looked in a state of low inflammation. Applying multiple ligatures I resected the omentum, as in the last case, and dropped it into the abdomen and completed the operation.

The case did well, temperature never going above 99·4°. On the 13th day, she left the hospital perfectly well, and since that time she has remained in perfect health.

Here prompt operation averted imminent danger of death, and the removal of a great mass of omentum lessened the intra-abdominal tension, while clearing the edges of the ring, applying a purse-string suture to the neck of sac, an interrupted suture to the aponeurosis, and deep supporting sutures through the skin, fat, and abdominal fasciæ, resulted in a permanent cure of this formidable trouble.

Case of Ventral Hernia following Laparotomy.

B. M'G., aged twenty-seven, was sent to me from Louth, labelled urgent. I must say I never saw any urgency about the case, and the details given by the patient as to the origin of her trouble only proved how little we laparotomists are appreciated by the ordinary public. The man who evulses a toe-nail, or passes a Eustachian probe, is a genius in the estimation of the ordinary run of observers, while if we safely guide a case through the dangerous stages of a prolonged laparotomy, and the patient afterwards gets a curable though enormous hernia, all the credit of a brilliant performance vanishes, and she calmly tells us, or more likely some one else, "The operation ruined me." You know the value to set on such statements; so do I. This was such a case, and I approached it with some concern, especially as Doctors Horne, Smith, and myself concluded that a hydrops peritonei was present, and that the patient was not over-vigorous.

I operated in this case on the 14th of November, 1893, assisted by Dr. Smith. Reaching the neck of the sac at one point, I attempted to follow it round as in Cases I. and II. I failed to do this owing to a sacculation, and was, therefore, obliged to dissect out each sac separately. After examining the interior of the sac I passed a purse-string suture round its neck, and tied it

firmly; section of the sac half an inch above this suture was rapidly carried out. While this was being done Dr. Smith held sponges firmly against the cavities from which I had removed the sacculi. I now passed six silk sutures through the firm and freshened aponeurotic ring, drawing the edges well over the fulness produced by the purse-string suture of the peritoneum. These were cut short, and I applied myself to checking bleeding from the subcutaneous tissues. Owing to their great vascularity—oozing being copious and continuous—I was obliged to pass a double thread from the extreme limit of the dissection on one side, and bring it along under the tissues of the floor of the incision and out on the opposite side, so that when I tied down a pledget of gauze on each side the entire centre of the cavity from which I removed the hernial sac was obliterated. This deep supporting suture and the skin sutures, applied as I shall hereafter describe, effectually checked the hæmorrhage and completed the operation. A very free discharge of clear serum, amounting to more than half a gallon, took place from the peritoneum when the sac was opened.

The temperature chart of this case is before you, and the notes from day to day. The first dressing was removed on the eighth day, and was found perfectly dry, the wound being firmly healed. Of course as yet this cannot be counted a cure; it is but a first step in that direction.

I must ask your forgiveness for detailing this case at such length, but the plate [exhibited] is an accurate drawing of the state of things found on dissecting out the sac, part of which I have shown to the Academy. My colleague, Dr. Smith, and Dr. M'Loughlin, of Boston, can vouch for their accuracy as well as for the description of the operation as given above.

Now, my reading of this case may throw light on the causation of an affection which unfortunately follows operations carried out with great care, and conducted by most competent hands. There are some who would relegate such cases to a museum for surgical impossibilities. They would have us believe that the occurrence of hernia after section

of the abdominal wall is fitting recompense for the imperfect application of antiseptic principles. To my mind we can trace to one cause the occurrence of hernia in these cases. In the hernia following the projection of sub-peritoneal fat the middle stratum of the abdominal wall was weakened by the hypertrophy of the fatty tissue, which found its way through at the point of perforation of a small vessel. In the umbilical hernia there never was a complete closure of the middle stratum, while in the last case the middle stratum alone was deficient. The peritoneum was firm along the line of section, so was the skin. The aponeurosis had been drawn aside owing to the action of the abdominal muscles, and was found not closely encircling the neck of the sac, but fully one and a half inches on the left, and two inches on the right from that structure, while above and below the protrusion dense fibroid tissue marked the line of repair.

I do not blind myself to the fact that this patient developed a hydrops peritonei, and that this trouble may have acted as a determining cause in this case; but no amount of dropsy could overcome the resistance of the tissues where the three layers of the abdominal wall are united.

This want of union of the mid-stratum, made up of the elastic fascia of Scarpa and the aponeurosis—formed by the fusion of the tendons of the external oblique, internal oblique, and transversalis—was the only pathological condition present in all these cases. I am satisfied we know the explanation in Nos. 1 and 2. I shall now endeavour to explain its occurrence in No. 3, and propose a remedy.

There is a disposition to complete operations on the abdomen by passing a row of deep sutures embracing the entire thickness of the abdominal wall, and intermediate superficial sutures usually securing skin only.

(*a*) How often do we in passing the deep sutures revert

to the fact, that there is a great tendency to retraction on the part of the essential constituents of a sound abdominal wall. My notion is that many cases depend for complete restoration of the abdominal wall on contraction of a very extensive cicatricial deposit between the widely separated lips of the aponeurotic opening. The failure of one or two sutures to engage a considerable mass of the mid-stratum of the abdominal wall would account for many of the protrusions which follow laparotomy.

(*b*) In the conduct of abdominal section there is a tendency to use ordinary catch forceps for the support of the peritoneum. I have noticed that many of these bite very hard, and seriously reduce the vitality of tissues subjected to such vigorous pressure. The parts supported by the forceps are drawn at times well up between the layers of the abdominal wall, and fixed there by the sutures. During repair these points become the seat of vigorous tissue change, with the object of remedying the ill effects of over-pressure; if lymph accumulates it must separate the tissues, and as the peritoneum unites rapidly behind the effusion the fluid presses forward and separates those layers which are slow of healing, the aponeurosis being last of all to firmly unite, the tendency is to thus cause a faulty union. To avoid this I have used the forceps represented in Fig. 1; they are so bent that they

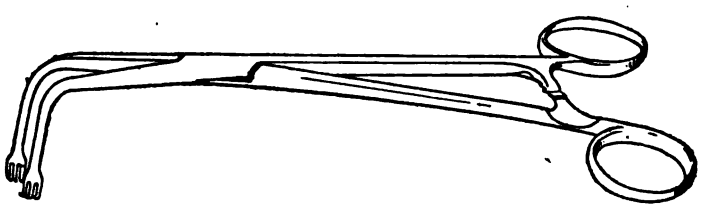


Fig. 1.

lie flat on the abdomen, and do not interfere with the further steps of the operation.

(*c*) Occasionally, too, unless all the layers of the abdomen are drawn together, a hæmorrhage occurs during reaction, the skin-wound is closed accurately, exudation has glued the peritoneal surfaces together, and the blood remains between the layers of muscle or aponeurosis, as the case may be, preventing early union, and any vigorous effort causes rupture.

(*d*) Again, low vitality permits lymph exudation to break down, or possibly direct infection sets up a circumscribed suppuration. This prevents the edges of the mid-stratum uniting, and hernia follows.

There are thus many causes of want of union of this essential layer of the abdominal wall, and I would place them in order of importance—

1. Failure to engage the different layers of this stratum sufficiently in the sutures.
2. Interposition of contused peritoneum.
3. Hæmatoma not becoming soundly organised.
4. Suppuration from inherent or extrinsic causes.

The remedy for this is to suture the abdomen in all laparotomies as we do for hernias, to obliterate all cavities in which blood or serum could collect, and to avoid contusing the peritoneum by using catch forceps, such as I suggest, with sharp points.

The steps of the operation, as I believe it should be conducted, are—Incision of skin on one side; isolation of the neck of the sac along this side, then undermining not only the skin, but all the tissues on the other side of the neck, making it possible to cut cleanly through everything down to the neck of the sac with strong scissors with long handles. This done, and being satisfied by opening the sac that no omentum or bowel remains in it, a Hagedorn's needle is carried round in the sub-peritoneal tissue, like a purse-string, as in Fig. 2 A. This being drawn and tied, numerous sutures carried with the same needle

through the aponeurosis, as at Fig. 2 B, close the wound over the mouth of the purse after cutting away the sac a quarter of an inch or so above that ligature.

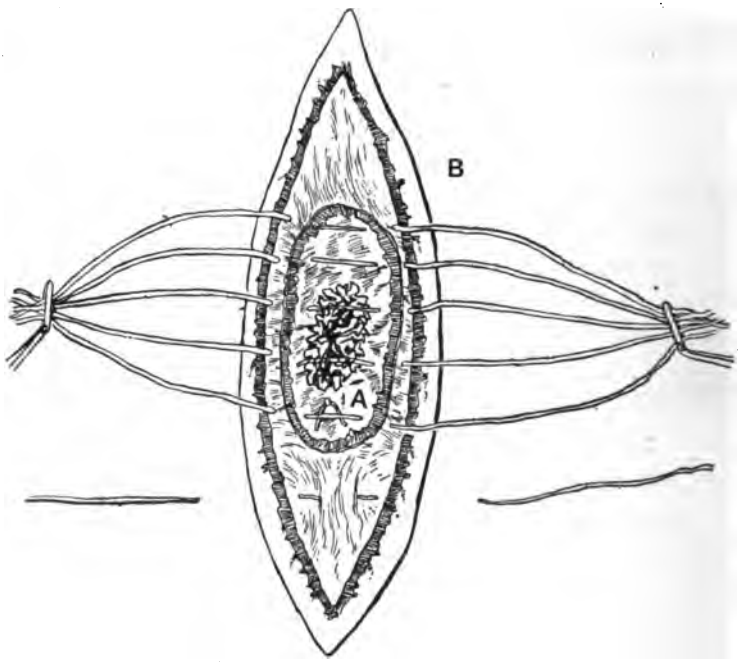


Fig. 2.

Skin sutures passing deeply, and taking up the floor of the wound, are now applied and knotted, and the operation thus completed. The needles and holder (Pozzi's) required for this are represented in Fig. 3. After opening the sac to examine its interior, a sponge, or a holder is held in the mouth of the sac to prevent protrusion of the intestines.

If apology be needed for bringing this subject before you, I think the following extracts are ample proof of the neglect of this operation :—

Macready ("A Treatise on Ruptures," 1893).—The operation consists in exposing the tumour, dividing it carefully to

see whether it contains a peritoneal sac, and, if so, dealing with the sac either by excision or Macewen's method.

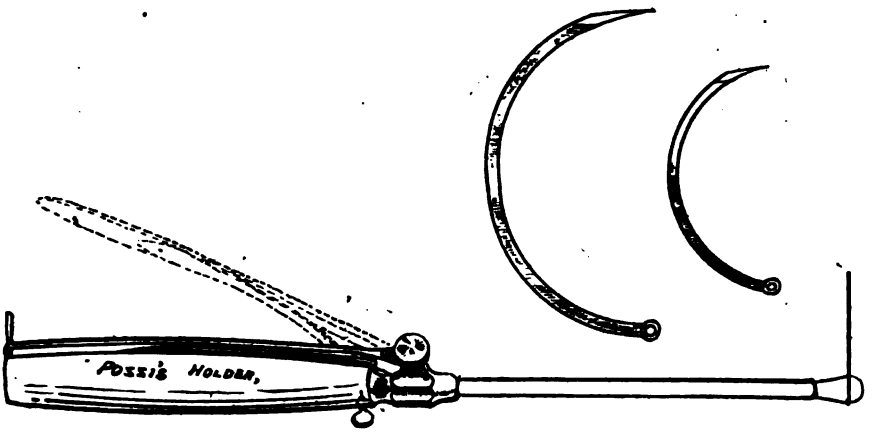


Fig. 3.

Keen and White ("American Text-book of Surgery," 1893). The radical cure of umbilical hernia is seldom undertaken because of the unsuitability of the subject of it for operation. Should an operation be performed, it should be done, if possible, "without opening the sac." *This book recommends a drainage tube to be left in*—Where?

Treves' "Operative Surgery" concludes a very accurate description of the operation by saying, and rightly so, that no drainage tube is required; but, even in his description there is one defect, and it is the instruction to excise the whole sac down to the aponeurosis. Now, if he means to apply this to hernias of recent origin, whether umbilical or in the linea alba after laparotomy, he will sooner or later meet with serious mishaps; for the moment you cut the neck of a recent hernial sac, retraction of the peritoneum takes place, and leaves a patch of the anterior abdominal wall devoid of serous covering, and this, we all know, is not a condition

to be eagerly sought after. In these cases suturing, as in laparotomy, is not sufficient. Apposition of the different layers of the abdominal wall is necessary.

How soon books are out of date! The great Encyclopædia of Ashhurst contains only the elaborate details of Woods' *subcutaneous wire suture.* Now, the specimen which I here exhibit should be a warning to those who still cling to the ancient methods of blind surgery. This bottle contains the result of two operations carried out by a distinguished surgeon for the relief of hernia by the subcutaneous wire suture. In both attempts the wire only engaged the anterior wall of the sac and so protrusion of the gut took place behind them. Their complete removal by the open operation, and with them the sac of an almost gangrenous hernia has removed a serious danger which was in the case always present, as, owing to the presence of the wires, no truss could be worn.

The patient to this day is not aware of the danger to which blind surgery exposed him. The operator is more than thankful for the clean sweep which I had the pleasure of making of his handiwork.

Dr. A. J. Smith said when he last read a report of abdominal section before this Section he had ventral hernia in two of his cases. One of the explanations then given was that he had abscesses in the track of his sutures, while another was that there was bad adaptation of the surfaces together. The difficulty was how subsequently to treat them. He said there was no abscess whatever, but after a month or so this accident occurred on very slight exertion. In one of the cases he could dip in his finger as if the sutures cut their way through everything. He then dissected the skin flap, split it, sutured, &c., and the patient was now quite well. The next operation was one he performed last January on a patient who had a fibroid tumour. There was no necessity to

remove the fibroid, but there was to remove a small umbilical hernia which, on one occasion, nearly caused her death. He performed the same operation—dissected the skin, passed strong sutures through the peritoneum, stitched the aponeurosis of the flap, and union was so good that all last autumn she was engaged pitching hay in the meadows. He did not believe that abscess was the cause of ventral hernia at all, and he agreed with Mr. M'Ardle that the retraction of the elastic aponeurotic fibres of the middle stratum seemed to be the most important with reference to the union in abdominal sections.

Dr. W. J. Smyly said it was his misfortune not to have heard the paper in full. In speaking about ventral hernia, they must distinguish between those which were congenital and acquired, and he was not aware that Mr. M'Ardle referred to the congenital. He himself operated on two cases of that kind by the flap-splitting method of Tait. When a congenital umbilical hernia was cut down on a very thick ring was found on the edge of the aponeurosis, and it was very easy to split it up with scissors. One could then turn one flap down and the other up, so as to get flat surfaces of aponeurosis opposed to each other. He had two operations of the sort, but, as he had not seen his patients since, he could not speak as to the ultimate result. Hernias that occurred after abdominal section were a great trouble, and brought discredit upon the operation of abdominal section. In order to avoid them one had to make the incision in a certain way and in a certain place, and stitch it with certain precautions. All these certainties were nothing more or less than uncertainties, and if different books were consulted they would see that different men laid emphasis on points totally opposed to each other. He thought it was a matter of importance not to make the incision through the linea alba, but to one side of it, so as to lay open the sheath of one rectus muscle. Good union would be the result, and especially so in cases where the tissues were stretched by large tumours. The incision should also be as high up in the abdomen as the circumstances of the operation would permit, and the incision itself should be clean-cut and not bruised. He had given up gradually the use of the pressure-clips, and he was struck lately by how little the most successful operators had used them. There were a great many different methods of suturing, but he thought the simplest method the best, especially when the results were equal. The simplest method was Dr. Martin's, and there was fully one and a half or two inches,

between the sutures, and still no one had better results. He thought suppuration had a great deal to do with the occurrence of hernia after abdominal section. When a wound suppurated granulations sprang up, and the cicatrix atrophied and became thinner, and it was only by the direct union of living tissues that stretching could be avoided. Again, the too frequent use of clips would crush the tissues and make them more liable to tension, and if there was any suppuration in the neighbourhood these parts would infallibly suppurate too.

Dr. Parsons inquired as to the advantages gained by suturing the abdominal wound in layers.

Dr. A. J. Smith said that he had adopted Mr. M'Ardle's method. e thought that the layer directly over the elastic layer retracted considerably. He thought more attention should be given to the middle stratum than to the peritoneum or skin. In all the hernias that he had seen it was owing to the non-approximation of this stratum. They should examine carefully each suture and see that it went through the stratum, as sometimes the superficial layer retracted.

Dr. F. W. Kidd thought it was admitted that often there was damage done to the tissues by the pressure forceps. It would be of interest to him to know what other means were adopted to check hæmorrhage from bleeding points.

The President referred to the greater likelihood of hernia occurring after suppuration in the suture track. He mentioned the case of a patient from whom he removed the appendages, and who, several months afterwards, during an attack of severe bronchitis, suffered from a considerable protrusion. With reference to the operation for umbilical hernia, he remembered a patient from whom he removed an ovarian cyst, and in concluding the operation he removed the sac of a congenital umbilical hernia also. Owing to the dense, firm adhesions the operation was protracted, and the patient fell into a state of collapse, but rallied in about an hour. Three hours after she vomited some black matter and died, and the autopsy showed that a gastric ulcer had given away, while the cicatrices of several other old ones were present.

Mr. M'Ardle said if he had done nothing more than elicit those valuable remarks of Dr. Smyly he would be well repaid for his trouble. He said flap-splitting was the only operation where the peritoneum was fixed to the ring—it was the only one where they could have material for their sutures. He was glad to hear that

the use of clips was lessened considerably, and he did not believe that a great number of sutures were necessary. With reference to Dr. Parson's question, he said the importance of the third layer of sutures was that it leaves no space in which fluid could accumulate.

COLECTOMY FOR ADHESION OF CÆCUM TO OLD OVARIAN PEDICLE AND TUBERCULAR APPENDIX.

By ALFRED J. SMITH, M.B.;
Professor of Midwifery, C.U.I.;
Fellow, British Gynæcological Society.

[Read in the Section of Obstetrics, December 23, 1893.]

I ASK your indulgence whilst I read for you notes of what was to me an extremely interesting case, in the hope that it may present some points for discussion and of interest to the members of this Section of the Royal Academy of Medicine.

CASE.—A young married woman, named Mrs. G., aged twenty-four, was sent up from Westport to my gynæcological wards in St. Vincent's Hospital towards the end of September, 1892. She had been then married four years, and had three children, each at full term and healthy. About a month after the first confinement she complained of pain in the right inguinal region, referred to a point midway between the umbilicus and the anterior superior spine of the ilium. Her local physician exhausted all the usual remedies for obtaining relief—such as poultices, blisters, sedatives, hot hip-baths, &c.—without any permanent benefit; the pain for the twelve months before her admission became so intense that she was unable to perform her household duties, and she had to take to her bed as an invalid. She suffered also from heavy floodings during her menstrual period, the duration being about 10 days, with a gradually-diminishing interval between the periods.

Examination.—External genitals normal in development, vagina normal, uterus anteflexed and displaced towards the left, movable, not tender on pressure; length, 7·5 cm. The right broad ligament contained a Fallopian tube, slightly tender on pressure, and it could be easily felt as a tolerably firm cord. The right ovary felt very large—the size of a billiard ball—and was exquisitely tender on

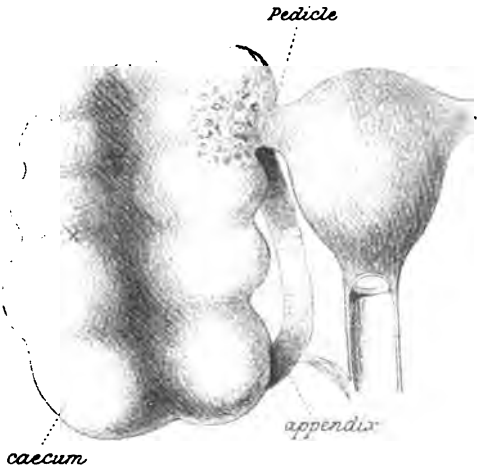


Fig. 2, showing relation of adhesion (diagrammatic) Pedicle is shown much too long.

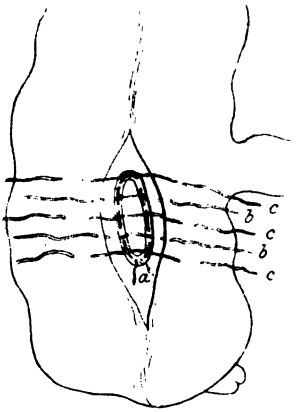
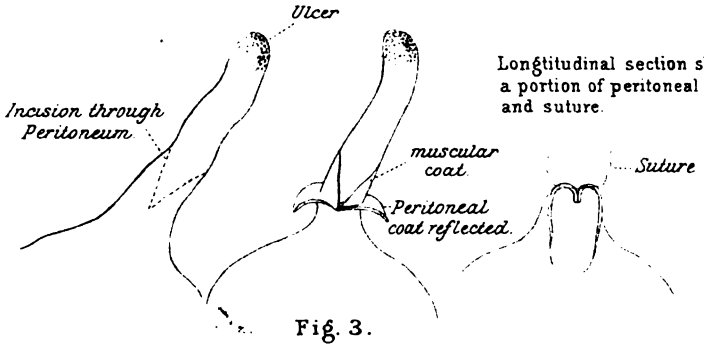


Fig. 4.
a. Purse-string. *b.* Intermediate taking in edge of Peritoneum. *c.* Lembert's.



Longtitudinal section showing a portion of peritoneal layers and suture.

Fig. 3.

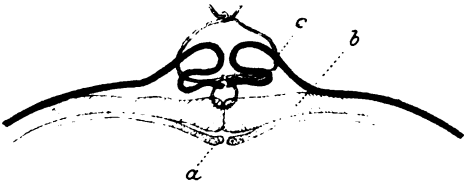


Fig. 5. showing suture in section (diagrammatic)
a. sub-mucous tissue. *b.* muscular layer.
c. Peritoneum (suture partially fixed.)

F Huth, Lith^r Edin^r

pressure, the patient calling out and attempting to jump off the couch each time the ovary was pressed. The left ovary and tube felt normal; no tenderness. I determined to operate, and placed the patient on Trendelenburg's table and made a two-inch incision; the diseased right ovary came easily into view. This I removed along with the Fallopian tube quite close to the uterus, using strong silk and transfixing the pedicle. The left ovary was examined; it looked and felt normal, and so was preserved. The right ovary was examined by Dr. Patteson, who described it as being distended by a great number of small retentive cysts. In fact the ovary was a specimen of Hydrops folliculorum—I showed it at this Section of the Academy—and it is preserved in the Museum of the Royal University—a line drawing of which is here shown (Fig. 1). Her recovery from the operation was rapid and uninterrupted; the temperature and pulse never exceeded the normal. She complained of great abdominal pain, commencing eight hours after the operation and extending into the night. The patient called out several times for relief, so intense was the suffering. I ordered ¼ gr. morphia hypodermically, which only gave temporary relief; the pains ceased after the discharge of some blood from the uterus during the next day. Bowels moved by five grains of calomel on the third day after operation. Incision stitches removed on the eighth day; union good. Patient left for the country, relieved from her suffering. Shortly after her return to the country the old pain in the right inguinal region returned; this greatly distressed her, and she begged of me in many letters to do something for her. At first I was of opinion that the pain was perhaps exaggerated, and wrote encouraging her in the belief that it would wear away. She was not to be deceived, for in the beginning of May in this year, six months after the first operation, she again visited my wards in St. Vincent's, and implored me to operate, the pain being quite intolerable.

I made a careful bi-manual examination, and found that the uterus was normal as to position; the left ovary had become greatly enlarged; the right broad ligament, or what remained of it, felt thickened, and was decidedly tender on pressure. Accordingly, on May 24th, 1893, having hoisted the patient on Trendelenburg's table, I opened the abdomen in the track of the old incision; there were no adhesions to break down, the back of the incision being quite free. The intestines did not fall away, and could not be pressed aside easily with a sponge. I found the cæcum had

become adherent to the old pedicle by a very dense and intimate adhesion. The left ovary was larger than a good-sized hen egg's and felt cystic. I determined to remove it quite close to the uterus.

Now, what was to be done with the adhesion of intestine to pedicle? Obviously to separate it; but such a procedure required a resection of the intestine. The patient's condition was too low for such a serious operation, and Mr. M'Ardle agreed with me that such an operation, requiring a prolonged exposure of the peritoneum, would militate greatly against her chance of recovery. We hoped that the anæmic condition of the uterus brought about by the removal of both tubes and ovaries would starve the adhesion, and perhaps lead to its atrophy. We, therefore, reluctantly closed the abdominal incision. I showed this ovary at the May meeting of this Section of the Academy. It had undergone the same degeneration as the right ovary. The recovery from the operation was good; no rise of temperature or pulse; the bowels moved the third day; and the stitches were removed on the eighth day, union good.

After the second operation in May it was hoped that the intolerable pain would be benefited. Such was not the case. At first there was temporary relief, but soon the old dragging pain returned with renewed intensity, especially at night, and the patient was confined to her bed, a burden to herself and her family. Nothing was left to be done except to separate the adhesion.

I again admitted her to St. Vincent's Hospital in the second week of November last and made a careful bi-manual examination. The uterus was still normal in position; the right pedicle, with its adherent intestine, could be easily felt as a thickened indefinite mass; it was distinctly tender. Nothing calling for note was felt on examining the left pedicle. I inverted the patient on Trendelenburg's table and opened the abdomen a little to the right of the mesial line. There was a slight omental adhesion along the track

of the old incision. Before I could put my fingers into the pelvic cavity I had to draw aside the omentum and the small intestines—they had become anchored to the pelvic organs by firm adhesions. There was some difficulty in getting the adherent pedicle well into view, but eventually it was brought well up to the abdominal incision (Fig. 2). A narrow sponge held by an American forceps was placed under the arch formed by the adhesion; the intestines were protected by sponges wrung out of a warm saline solution. The pedicle and cæcum were now held tense by Mr. M'Ardle whilst I separated the adhesion. To our surprise pus welled up; this was mopped up with moist corrosive wool, and the separating process continued, revealing an extensive ulcerating cavity, formed by the end of the old pedicle, a portion of the wall of the cæcum, and the vermiform appendix. I carefully disinfected the ulcerating surfaces with corrosive sublimate solution 1 in 1,000, and proceeded to deal with each affected portion in turn. The pedicle was short, quite close to the uterus; it was swollen to the size of the last phalanx of the thumb. Many large veins could be seen around its border; they looked like hæmorrhoids, and concealed the ulcerating surface like a monk's cowl. On unfolding the cowl the old silk ligature was found lying quite loose, and apparently unchanged. [Specimen here shown.] The substance of the stump was very rotten, and gave way easily on the least tension. I transfixed it with a stout silk ligature and tied cautiously, and then cut away the ulcerating surface. I ligatured the vessels separately.

The vermiform appendix was next treated. Its behaviour was decidedly interesting—it was quite turgescent like a semi-erect penis, and beat regularly, the rhythm of the beat synchronised with the pulse. Its crown or apex was eaten away by an ulcer of tubercular character, and its stem greatly thickened (Fig. 3). The appendix was now held upright whilst I made two oblique incisions through its peritoneal covering, then peeled the peritoneal layer back, as one does the prepuce in circumcision, and amputated the central portion. The tops of the two flaps were next inverted and brought together by two No. 4 silk sutures (as in diagram). The ulcer on the cæcum was the size of a two-shilling piece, with undermined edges; it was tubercular; its base was slit across to find its extent, and it was found to penetrate as far as the submucous tissue. The intestine was held up by Mr. M'Ardle, and the entire ulcerating surface was snipped off with a scissors, leaving healthy tissue on all

sides. The submucous tissue was brought together by a purse-string suture (see diagrams, Fig. 4); then the muscular layers by interrupted (No. 4) silk suture, taking in the edge of the peritoneum (see diagram); and, finally, the peritoneum by Lembert's sutures; (see diagram); the pelvis was dried and a drainage-tube inserted. The operation, now complete, was performed under 60 minutes.

On recovering from the ether very excessive and persistent vomiting set in, which was so distressing and accompanied by such great abdominal pain that, contrary to my usual practice in abdominal sections, I was compelled to administer ¼ gr. of morphia hypodermically, fearing that the exertion and strain of vomiting might do some damage. About three hours after the operation it was noticed that the temperature was 97° F., pulse 110, and the dressing was soaked with blood. I dressed the case and aspirated out of the drainage-tube about a tablespoonful of very dark blood. I hoped that this dark-coloured discharge pointed to a cessation of the hæmorrhage, and I gave orders for the pulse and temperature to be taken every half hour, and the dressing to be watched. The patient was under morphia, but on the effects passing off vomiting again returned about 9 o'clock p.m. I happened to be present, and noticed the patient got very pale; pulse 120; temperature subnormal. She complained of severe pain in the abdomen and the sacral region. Her appearance showed much distress. I considered the pedicle ligature must have slipped, so telephoned to Mr. M'Ardle, who kindly came at once. Both of us took extraordinary care to render our hands thoroughly aseptic. The patient was too weak to be removed from the bed, so, with the aid of candles held by nurses, I re-opened the abdomen. Blood welled up, just like the hæmorrhage in a ruptured tubal pregnancy. Two fingers slipped down to right side of uterus engaged all the tissues, and effectually checked the hæmorrhage while the large blood-clots were rapidly removed; we then saw that the silk ligature had cut through the rotten pedicle and was hanging on to a shred. How were we to stop the hæmorrhage—there was no pedicle left? We accomplished it by transfixing part of the uterine wall with a stout silk ligature, tying in two bundles; this controlled the hæmorrhage. For extra safety separate ligatures were put on the vessels. I took the opportunity of examining the intestinal suture, and found the suture track well glazed. I then flushed the abdomen with a warm saline solution and left in a drainage-tube; the excess of saline fluid was not aspirated—it was left to be absorbed by the peritoneum, the anæmia

of the patient was so great. Again, on recovering from the ether, vomiting set in; drop doses of tincture of iodine given in a teaspoonful of hot water stopped the nausea at once. I had preparations made to wash out the stomach in case the vomiting continued. The patient's recovery was extraordinarily rapid; the pulse, which was uncountable after the operation, gradually became stronger and stronger. I was able to remove the drainage-tube on the 4th day. Bowels moved 48 hours after the operation by three grains of calomel, followed by a seidlitz powder and turpentine enema.

Her recovery was uneventful, and was remarkably afebrile. The pains are all gone. All the incision stitches were removed on the 8th day, except the suture in the drainage-tube track, which was taken out on the 10th day; union perfect.

It would be ungenerous on my part did I not acknowledge the skilled assistance of my colleague, Surgeon M'Ardle; his intimate knowledge of intestinal surgery was most valuable; his advice was generously given, and the success of the cases is in no small measure due to him.

What was the cause of the pain? I believe now that there was originally a tubercular deposit in the appendix; a low form of inflammation was set up, and it became adherent to the cæcum, infecting it; its subsequent adhesion to the pedicle stump was a mere accident. Critically, I believe this to be the case, and the severe pain suffered by the patient was the same in position, intensity, and character as that for which she was originally operated on; and that the coincidence of an enlarged and painful ovary, accompanied by severe menstrual floodings, caused the condition of the appendix to be overlooked.

I beg to call attention to the fact that this case illustrates—

1st. The value of drainage.

2nd. The rapidity of glazing after suture of the intestine.

3rd. The rapidity of suture by the purse-string and Lembert's method.

4th. How, even after very copious hæmorrhage, death may be arrested by prompt treatment.

And 5th. The necessity for careful examination of the vermiform appendix in cases of persistent right side pain.

Dr. W. J. Smyly thought the method Dr. Smith adopted with regard to the appendix a very neat one. In one case where he removed the appendix he simply pushed in the stump and stitched the peritoneum over it. While in Germany lately he had seen an appendix removed, and the operator simply tied it as if it were an ovarian pedicle, and snipped it off.

Mr. M'Ardle said he believed that in the peculiar movement of the appendix they saw the cause of the spasmodic pain that the patient suffered from. It was the contractions of it which caused the pain, and there were many cases of intestinal obstruction where attachment of the vermiform appendix set up either spasmodic or paralytic obstruction.

Dr. Parsons inquired whether Dr. Smith's statement as to tubercular ulcer of the appendix was made from a naked-eye or a microscopic examination? As far as he was aware tubercular ulcer, confined to the vermiform appendix, was comparatively rare.

Dr. A. J. Smith, in reply, said he found the method of amputating the appendix exceedingly quick, while it was a very secure method also. He thought the pain was due to these curious contractions of the appendix. In reply to Dr. Parsons, he said he had not yet had time to make a microscopic examination, but in the opinion of experts it was a typical tubercular ulcer, and there was no evidence of any concretion.

ON VAGINAL HYSTERECTOMY.

By LOMBE ATTHILL, M.D.;
Ex-Master of the Rotunda Hospital, Dublin.

[Read in the Section of Obstetrics, February 2, 1894.]

MALIGNANT disease of the uterus has, till within the last few years, been invariably fatal. To diagnose it correctly was, in fact, in all cases synonymous with pronouncing sentence of death, and that, too, by a slow, painful, and irksome process. The patient died worn out by pain, exhausted by frequently recurring hæmorrhages or by septicæmia. Seldom does any disinfectant suffice to remove the fœtor of the discharges in the advanced stages of cancer. No wonder, therefore, that the dread of this loathsome disease is present to the mind of nearly every woman who may suffer from any form of chronic uterine trouble; no wonder that vigorous efforts have been made by many surgeons to arrest its progress, and possibly to cure these sufferers, by means of the actual cautery, by the free application of powerful caustics, by amputating the lower segment of the uterus when the seat of malignant disease, by curetting the cavity when it was primarily affected, or, as advocated by the late Dr. Marion Sims, by dissecting off with knives specially made for the purpose the whole of the intra-uterine surface, and then filling the cavity with cotton saturated with a strong solution of chloride of zinc.

All these proceedings are vain; I have tried them all myself, and have seen them tried over and over again, and in no one case of any form of true cancer did anything more than temporary benefit follow. Now hysterectomy is an accepted operation, the mortality following its performance

is small, and if cases be properly selected, the prospect of the recurrence of the disease is certainly less than when other organs are attacked by cancer. That this should be so is easily understood, for the uterus is not alone not essential to life, but is as it were isolated from the general system. Of this I am satisfied, that malignant disease of the uterus is in general, and when the cavity of the uterus is the primary seat of disease, always, in the first instance a purely local affection, and that it is not till it has reached a comparatively advanced stage that the system becomes infected.

I shall relate three cases in which hysterectomy was performed on patients under my care, and then shall endeavour to point out the lessons to be deduced from them.

Case I.—Miss ——, aged forty-two, came under my care in February, 1890. She had been always healthy, and had lived an active life. Menstruation had been normal till about a year ago, when she first noticed it to be profuse, and then that the flow recurred at shorter intervals. She began to lose flesh, and suffered from pains in lower third of the back. In December, 1889, she had an alarming attack of hæmorrhage, which compelled her to seek medical advice. Since then had seldom been free from a watery hæmorrhagic discharge. A digital examination proved the vaginal portion of the uterus to be healthy. The fundus was very large, but quite movable; the os was patulous and the introduction of the sound was followed by hæmorrhage. I diagnosed epithelioma of the cavity, but I did not at the time inform the patient of my opinion, but advised that the uterus should be dilated and its cavity explored. I made this suggestion more with the view of verifying my diagnosis than with the hope of effecting much good. Accordingly, a few days later, this was done, and I removed with the curette a large quantity of soft growth, which was plainly cancerous. I then injected tincture of iodine, and on three or four occasions subsequently 15 minims of iodised phenol. At the time of the operation I suggested to her medical attendant the advisability of performing hysterectomy, but he thought the risk of life too great.

The patient improved greatly after this, and there was no return of the hæmorrhage or of the pain for nearly two months, but at

the expiration of that time she came to me and stated that she had become as bad as ever. I then told her that her only hope lay in the removal of the whole organ. She at once consented to undergo the operation, which I performed on May 1st, 1890. During the four years which have since elapsed I have had this lady under my observation, and I am happy to say that she is in the enjoyment of most excellent health. The uterus was examined by Dr. Bewley, whose report I append:—

"Length of uterus, 4½ inches; length of cavity, 3¾ inches; weight, 5½ ozs. The uterine tissue felt firm and healthy externally. On opening the organ the cavity was found to be large. The mucous membrane at the os and for half an inch up from it was healthy; then for 1½ inches the surface was irregular and ulcerated, and covered with soft polypoid growths. The ulceration had in one place—on the anterior aspect—extended to the surface of the uterus, but perforation had not occurred. The upper 1½ inches of the intra-uterine mucous membrane was quite healthy. The uterine wall in the central ulcerated region was more transparent than elsewhere; it was fairly hard, though not as tough as normal uterine tissue. This part of the uterine wall showed cancerous infiltration—that is, polygonal epithelial cells were growing between the muscular bundles, either in the form of irregular masses or of large irregular-shaped tubular glands. The tissues cut through at the operation seemed healthy, although the cancerous cells had extended so as to be very near the surface indeed."

Case II.—Miss ——, aged fifty-seven, consulted me in February, 1893. She had ceased to menstruate at about the age of 30. This she believed to have been the result of a lengthened residence in Switzerland, but her health in no way suffered, and she did not observe anything wrong till about eighteen months previously, when a colourless watery vaginal discharge occasionally appeared; this by degrees became more profuse and deeper coloured, till of late it was continuous and sanguineous. The fundus of the uterus, though large, was quite free, and the cervix healthy. The introduction of the sound was followed by sharp bleeding. In this case I merely dilated the cervix sufficiently to enable me to remove with a small curette a portion of the intra-uterine surface for examination, which verified the opinion previously formed as to the nature of the case, and a few weeks later the patient submitted to hysterectomy, which on account of her means being very limited,

was performed in the Rotunda Hospital by Dr. W. Smyly. This patient is still under my observation, and there is no reason to doubt but that she is perfectly cured.

CASE III.—On August 4th, 1893, Mrs. —— was sent to me by Dr. Britton, of Strabane. She had been a widow for twenty years, and had given birth to five children. She was in her fifty-eighth year. Menstruation did not cease till she was fifty-two, and for the three following years her health had been fairly good, though she never was strong. In the autumn, 1891, she observed a red sanguineous discharge to recur at irregular intervals, and about two months before she came to me she had an attack of regular hæmorrhage, which weakened her greatly, but she did not suffer any pain. As in the two preceding cases, the uterus was large, but freely movable, and not indurated. The cervix was shortened and healthy. In this case, too, I dilated the os just sufficiently to permit the passage of a small curette. The portions removed by it were evidently parts of a malignant growth. I performed vaginal hysterectomy a few days subsequently. She made a rapid recovery, the temperature never rising above 100°; nor did she suffer any pain or even feel sick. The following is Dr. Bewley's report of the result of his examination of the uterus:—"The organ is somewhat enlarged, being 3¾ inches in length. When cut open the lining membrane, instead of being smooth, is rough and irregular in an extreme degree. The cavity is bounded on all sides by masses of soft semi-gelatinous tissues which can be scraped away, leaving holes and fissures behind it in the uterine wall. No part of the lining membrane of the uterus is healthy, though the disease is much more marked in some parts than in others. Sections show masses of cells growing between the muscle bands in the uterine wall. I have no doubt that the disease is cancerous. The cut surfaces all appear healthy."

These three cases were very similar, and are typical of the class in which hysterectomy should be performed, and they all tend to establish three facts:

1. That the operation of vaginal hysterectomy, if carefully performed in suitable cases, is a safe one.

2. That malignant disease, when originating in the cavity of the uterus, is at first a local disease, and that, if the organ

be extirpated at an early period, it can be eradicated perfectly. This may be considered as proved in the case of the first patient operated on, four years having since then elapsed; the others are too recent for this to be said of them with confidence, though I believe it to be so.

3. These cases also tend to show that the constitution does not become infected till the cancerous growths either perforate the uterine walls, or, extending downwards, engage the vaginal aspect of the cervix; they show, too, that the uterine walls are capable of resisting for a considerable time the progress of the disease. In none of the foregoing cases could it have existed for less than a year prior to the operation being performed; indeed, in the last of the three narrated, it must have been, judging from the date at which the sanguineous discharge was first noticed, in progress for over two years; this fact, however, does not in any way modify the rule that the operation should be performed the moment the true nature of the disease has been recognised.

The great value of the operation of hysterectomy is now so universally recognised that it seems to me there are only two points connected with it open to discussion; one—and the most important one—the stage at which its performance is justified, or, to be more accurate, what are the conditions which should decide us against advising its performance; for it is almost impossible to operate at too early a date if once satisfied that the organ is the seat of any form of cancerous disease. But it is necessary that this be ascertained, for cases have occurred in which the diagnosis of malignant disease has been falsified by an examination of the organ after its removal. I think, therefore, it should be an established rule in all cases in which the disease attacks primarily the interior of the womb, that a portion of the intra-uterine tissue be first removed and examined. I am well aware that pathologists cannot always say definitely that a given

specimen contains true cancer cells, but where the result of examination is so doubtful, that no definite opinion can be given, I think it is wiser to be guided by the symptoms, and if hæmorrhagic, alternating with watery, discharges, be of frequent occurrence, and if pain be present, I should in doubtful cases be disposed, other conditions being favourable, to operate. In the great majority of such cases the disease progresses, and, when too late, will prove to be malignant. I should regret much less to have to think I had possibly performed an unnecessary operation than to see a patient whose life I might have saved die a lingering and painful death.

But it is important and far more difficult to decide whether it be too late to attempt to operate. I have from time to time been asked to advise in these doubtful cases. In the great majority of them I have been obliged to say that any operation would be unadvisable; in some the attempt to remove the whole of the disease was, nevertheless, attempted with most unsatisfactory results. Either the patient died rapidly from the effects of the operation, or recovered from it, to die ere long of the same disease, which rapidly developed in the adjacent parts. In my opinion, if the cervix be engaged to anything but a very limited extent, any operation is useless. If the cervix be healthy but the organ fixed, the prognosis as to the result of an operation is equally, or possibly more, unfavourable; and, of course, if both the cervix be engaged and the uterus fixed, it becomes still more so.

Another matter I lay stress on is the condition of the bladder. It is at the junction of the uterus and bladder that in cases in which the cavity is primarily engaged cancerous infiltration and ulceration are most likely to occur. This was exemplified in Case No. 1. In a very brief period that patient's condition would have been hopeless. She had been urged by her friends to go to London, to have my

opinion confirmed, or the converse, before submitting to an operation. Had she adopted that course I believe her doom would have been sealed by the mere loss of time. She had no sympton of vesical irritation. Other patients sometimes have. In brief, so long as I am satisfied that neither the cervix nor any adjacent organ is implicated, I urge the removal of the uterus. If the cervix be implicated, or if the uterus be not freely movable, and the bladder causing trouble, I consider it, as a rule, inadvisable.

It is to be borne in mind that I am speaking of cases in which the disease originates in some part of the interior of the uterus; the portion just above the os internum seems a favourite position for it to commence in, though no doubt the cavity, also, is in many cases primarily attacked. Of one thing I am certain, that, contrary to the statements so commonly made in books, cancer primarily attacks the body of the uterus much more frequently than is supposed.

In the cases I have detailed the uterus was removed *per vaginam*, and I believe it to be the best and safest operation, unless the fundus be too large to be without difficulty pulled through the pelvis. It is doubtless a troublesome operation, and, indeed, I may say irksome. The steps of it are so well known as to render any special reference to details unnecessary: thorough disinfecting of the vagina and adjacent parts prior to commencing the operation is, of course, indispensable, as well as strictly antiseptic precautions subsequently. After the first incision across the anterior surface of the cervix has been made, the finger, far more than the knife or scissors, should be used to separate the uterus from its connections with the bladder till the finger reaches the top of the fundus, and the cavity of the peritoneum is entered. This and the next step—that of opening into Douglas's pouch—is the easiest part of the operation; the real difficulty consists in safely dividing the broad ligaments, so as to avoid injuring

the ureters, and effectively securing the blood vessels. This is never an easy task, and is specially difficult when operating, as was the case in two out of three cases narrated, on nulliparous women of middle age, and in whom the vagina was narrow and indisposed to stretch.

In order to get at the broad ligaments more easily, and so to facilitate the securing of the uterine and ovarian arteries, it has been proposed to retrovert the uterus and pull the fundus through the wound in the posterior wall of the vagina. This I did in the first of the cases related. I do not intend to do it again. The fundus was very large, the difficulty of effecting the version very great, and the time occupied in doing so considerable, and no commensurate advantage was obtained. It is far better to drag down the uterus as low in the pelvis as possible, leaving it, however, in other respects in its normal position, and then to divide the broad ligament and secure the blood vessels.

It is the practice with some surgeons to seek for and remove the ovaries, and if they can be easily reached I do think it desirable, especially in the case of women who have not passed the climacteric period, for if left behind they may give rise to periodic attacks of pain and discomfort. In Case 1 one ovary was within reach, and was removed, the other could not have been removed without much trouble, and as the operation was a prolonged one I left it behind, and it has been a source of some discomfort; indeed, under any circumstances their removal gives additional security against a recurrence of the disease.

The only other question to be considered is whether the flaps of the divided vaginal wall should be approximated by the insertion of sutures or be left alone. I think the latter course, in general, the better. The parts shrink and contract rapidly; union soon takes place, and the cavity closes, while silk sutures, which are generally employed,

sometimes give rise to irritation. Packing the vagina with antiseptic gauze is quite sufficient to prevent any prolapse, while it secures drainage, even if a drainage tube be not used, and this sometimes, at least, can be dispensed with.

A troublesome accident happened in the first of the cases I have related, which I am unable to account for. The catheter was passed every eight or ten hours for some days after the operation; then the patient was allowed to use the bedpan, and she was able to empty the bladder without trouble; but on the tenth day after the operation urine was observed to escape *per vaginam*, and continued to do so for several weeks, when it ceased to flow. What was the cause of this? The bladder could not have been wounded during the operation, or urine would have escaped sooner. As the wound was a very large one three or four sutures had been placed in the flaps to cause them to approximate. Could the needle have penetrated the wall of the bladder while one of these was being inserted? I cannot say. I state the facts of the case.

I do not like to close this paper without alluding to those cases in which the cervix is the primary seat of cancer, and the advisability or otherwise of performing hysterectomy in such.

Pathologists are not agreed as to the direction in which in such cases the disease progresses. Dr. Cullingworth seems to believe that it spreads upwards. Dr. Williams, discussing the cases shown by Dr. Cullingworth, contended that the specimens exhibited showed that the tendency was for it to grow outwards, and to invade the parametric tissues,[a] and stated that his experience convinced him that where amputation of the cervix had been practised the disease, if it recurred, was found to have invaded the adjacent cellular tissue and not the stump. This tallies with my own expe-

[a] British Medical Journal, April 19th, 1890.

rience, and was well marked in the case of a patient on whom I performed supravaginal amputation of the cervix for cancer. The patient appeared at first to have been cured, but after an interval of a year or more came again under my observation, and died in hospital; and a *post-mortem* examination proved the uterus to be healthy, but all the adjacent parts were extensively infiltrated with cancer cells.

Inclining as I do to the views expressed by Dr. Williams, I have the greatest disinclination to recommend any surgical treatment in the majority of these cases. Amputation of the cervix I deem, except as a palliative, to be useless, and unless the case be seen at a very early stage indeed, hysterectomy I consider inadvisable.

I have deemed it best to confine this paper to the consideration of cases in which malignant disease attacks the uterus. To enter into a discussion of the question of hysterectomy in connection with myomas would be to extend it unduly; but it is not to be supposed that I do not recognise its value in such cases, only I fear that there is a tendency to have recourse to the operation now-a-days somewhat too frequently. Nor do I ignore the fact that it seems to me that as our confidence in the safety of the operation extends, so will the frequency of its employment also extend. Thus there are certain forms of prolapsus uteri in which I am of opinion it should without hesitation be practised. Take those extreme cases, not so infrequently met with amongst the poor, in which nearly the whole of the uterus lies outside of the pelvis and the organ hangs down between the thighs—no plastic operation can be relied on in such cases, and no instrument will retain the organ with comfort *in situ*. These cases, too, are most favourable for vaginal hysterectomy because the organ is so accessible, and I believe that in such it will by-and-bye be not infrequently performed.

Dr. W. J. Smyly said he met the lady recently on whom Dr. Atthill performed the first operation, and she was in perfect health and spirits. He thought that one case like that would be quite sufficient to prove the value of the operation. He thought the reason why this operation had made such little progress in these countries was, that they seldom got cases to operate on in a sufficiently early stage. He thought that whenever a woman had a considerable hæmorrhagic discharge, it was the duty of the medical attendant to examine her, or send her to some one who would do so. The patients of eighteen years and upwards were told that it was their changes, and at forty years that it was the change of life. He thought it was time that these loose and absurd ideas about the change of life should be done away with. In fact, women at the change of life should be examined much more carefully than at any other time. He could only reiterate what Dr. Atthill had said regarding doubtful cases. If there was a doubt after a microscopic examination he would be guided by the symptoms, and if they were such as to necessitate operation, he would extirpate the uterus whether it was cancerous or not. He meant such cases of adenoma, even benign, and chronic metritis, where, after curetting, &c., the hæmorrhage was continuous. In a case of pyo-salpinx he also removed the uterus, and this operation is the recognised one in France. With regard to the diagnosis as to whether the disease has gone beyond the reach of the knife, if in doubt at all he would not operate, because he generally found that the disease had gone further than one thought. The uterus should always be freely movable; it should come down with ease, and on making a *per vaginam* and *per rectum* examination, the broad ligaments should be found free from disease, and also the utero-sacral ligaments. The operation was most successful in cases where the disease is not far advanced. He thought they might dispense with the curette in these cases, as the microscopist wants muscle. He also agreed with Dr. Atthill regarding the bladder. He thought it much easier to retrovert the uterus and then pull it down through the vagina. He looked upon the removal of the ovaries as very important. In the first place the disease might spread along the tubes to them; and in the second place, if the functions are active they can only cause trouble, and the patient may subsequently have an abdominal pregnancy. As to cancer of the cervix, he would do exactly what Dr. Atthill said, because it was safer to remove the whole of it

than to do supra-vaginal amputation of it. Besides, if they did not prolong the woman's life, they made it more comfortable both to herself and friends.

Dr. Horne said—At the age of fifty the uterus had virtually ceased to be an active organ, and therefore its removal did not carry the same amount of responsibility as it would before that age. He thought, then, that they would be more justified in removing it at fifty years of age than at forty. In the first case which Dr. Atthill mentioned, he noticed that for two months after the curetting the hæmorrhage ceased. But on finding that the hæmorrhage returned at the end of that time, he removed the uterus. Well, as the patient was only forty years of age, the question arose whether he was justified in performing hysterectomy unless after a microscopic examination.

Dr. Bate referred to Dr. Martin's (of Berlin) method of operating. He saw him perform the operation, and he commenced from below; and when about two-thirds of the uterus was separated from its attachments, he commenced to separate the uterus from its attachment to the bladder, and then anteverted it, and separated the small portion that remained. He also performed it for cases of procidentia.

Dr. Macan mentioned that when he was president of their branch of the British Medical Association, he remembered Leopold, of Dresden, exhibiting 40 cases there. Hence, they must recognise that they were rather behind-hand here in performing the operation. Of course, in all cases where there is a cancerous uterus, they should operate, unless there were very good reasons against it. The only question was, what were the exact things that should prevent them from operating. Unless there was absolute certainty almost that the case would be unsuccessful, he would be entirely in favour of operating. And here he was not quite in agreement with them as to the exact contra-indications. He did not consider that a thickening of the broad ligaments was an absolute contra-indication, because they might have an inflammatory thickening of the broad ligaments. In cases of cancer of the cervix, he also thought it much better to operate, because they would, at all events, stop the hæmorrhage and the fœtid discharge. He said Leopold looked upon two years as the limit beyond which they might look upon the patient as cured. He himself had a sad illustration in a patient who died three years after, and for that reason he could not look upon two of the

patients to-night as cured until they heard a little more about them. He said Leopold removed the uterus for fibrous tumour, and if the uterus was of very considerable size it was better to err on the side of operating.

Dr. Atthill, in reply, thanked the members for their interesting observations. He had no intention of bringing anything novel or wonderful before them, but simply a few interesting cases. The operation of hysterectomy was a simple one, and no one would hesitate to remove the cancerous uterus just as they would remove a breast. He thought as long as the operation was safe they were perfectly justified in doing it, even if the cancer recurs. He entirely agreed with the President that it was best to err on the side of mercy, and relieve the patient's horrible condition by operating, even if the operation would be a useless one otherwise. Dr. Macan very properly criticised these cases as cases of cure, but what he (Dr. Atthill) meant to convey was, that they tended to prove that they were cases of cure. He did not understand the advantages of the operation mentioned by Dr. Bates as done by Dr. Martin.

MYOMATA TREATED BY ERGOT.

By RICHARD D. PUREFOY, F.R.C.S.;
Obstetric Surgeon, Adelaide Hospital.

[Read in the Section of Obstetrics, March 9, 1894.]

THE number and variety of surgical procedures which in the present day are in use for the relief or cure of troubles connected with uterine fibroids, as well as for their entire removal, would furnish ample material for a long paper; and the fact that by their means most brilliant results are sometimes obtained, tends to make us and our patients impatient of slower and less heroic modes of treatment, especially by the use of certain drugs. Winckel, in his recent work, well remarks—"If the recent literature on the treatment of uterine myomata were divided into the medical and surgical methods, it would be at once apparent that the latter is rapidly gaining in popularity. But we must not forget that though the number of cures recorded from operations is very large, yet there are just as many unsuccessful cases never published. When, therefore, we find 27 per cent. of fatal cases occurring in a total of 253 operations, performed by the ablest gynæcologists, we must remember that this percentage would be materially increased if the isolated unsuccessful cases were also included. Granting that great improvement has been made in the *technique* of the operation, and that the number of successes is larger than formerly, still the indications for myomotomy are by no means identical with those for ovariotomy. More frequently in the former than in the latter are the subjective, rather than the objective, symptoms, made the rule of action, instead of being guided by the certainty or uncertainty of success." Schroeder

writes—"In very exceptional cases only do I decide to operate at once. The majority of my operations have been performed only when I have been convinced of their necessity after long observation of my patient." These remarks by leading operators will serve to preface a few brief records of cases of uterine fibroids, treated by the injection of ergot, which during the past few years have been under my care.

Case I.—Patient unmarried, about thirty-five years of age, at beginning of treatment; large sub-peritoneal fibroid, chiefly occupying fundus and anterior uterine wall, giving rise to frequent vomiting, severe menorrhagia, and pain. Repeatedly this woman has assured me of relief to the pain and nausea for some days after each injection, and marked decrease in the bleeding. This now only occurs at intervals of several weeks; nausea is seldom felt, and it is evident the meno-pause will soon be established. A slow increase in size of tumour has been noted.

Case II.—Patient married, aged about thirty-six; childless; came from a distance to my *clinique* at hospital. Pain and considerable bleeding for several weeks. Uterus irregular in shape, much enlarged transversely, apparently from intra-mural fibroid. A few injections checked the hæmorrhage and pain, and when I saw her three months ago the uterus had become diminished in size so much that the entire disappearance of the fibroid may be safely predicted, and the case be classed with those in which a cure has been obtained by this treatment.

Case III.—Patient unmarried, aged about thirty-four; generally delicate for many years since an attack of scarlatina. When treatment by injection was begun the uterus exhibited general enlargement, reaching nearly to umbilicus; menorrhagia of a severe type constantly occurred, as well as frequent and painful micturition. The first improvement noted was a marked diminution in the monthly hæmorrhage, and of the pain which attended it. Soon afterwards the uterus began to diminish in size, and these satisfactory results steadily continued, though owing to the patient's change of abode I was obliged to discontinue the treatment. Coincident with this her general health improved, and some months ago she

emigrated to New Zealand to earn her livelihood as a servant. While she was under my observation without injection of ergot, we observed that at intervals of a few weeks the uterus became markedly increased in size and tender to touch for a few days, and these conditions were attended and followed by the escape of a red watery discharge. When last seen the uterus had sunk below the level of the pubis; in fact, was little more than normal size.

CASE IV.—Patient unmarried, aged twenty-eight; healthy aspect. Sought advice because of a distressing feeling of bearing down and frequent call to pass water. Examination showed much vulvitis, and revealed the existence of two small subperitoneal fibroids, engaging chiefly the anterior aspect of uterus, and causing a descent of the whole organ, which was attended with much distress as the patient's employment obliged her to stand constantly. Circumstances prevented her attending except at long and irregular intervals, and the uterus increased rapidly in size, and at length reached midway to umbilicus. The injection of ergot was then proceeded with, but was in a few weeks followed by general pain and soreness of the entire uterus with marked pyrexia, for which I admitted her to hospital. Our consultant, Dr. Atthill, was kind enough to see her with me, and expressed the opinion that she was suffering from peritonitis. A wet pack was applied, opium sufficient to relieve pain was given, and the urgent symptoms soon abated. Soon afterwards a thin, slightly coloured, not purulent, discharge, took place from the vagina, and a marked diminution in the size of the uterus was noted. About five months afterwards I had an opportunity of examining this patient, when I found the uterus normal in size and position, and except for some slight inflammatory thickening posteriorly, I could not have known that she had ever been ill.

I think it is not too much to describe both these patients as cases of uterine fibroids, cured by the use of ergot; and at any rate they illustrate the fact that this drug sometimes initiates a disintegrating process in these troublesome tumours which is not necessarily attended by suppuration or pyrexia, which continues after the use of the drug has been discontinued, and results in the entire disappearance of the neoplasm.

Case V.—Patient unmarried, aged about thirty-eight, sought advice for extreme anæmia brought about by menorrhagia. The uterus was found in a condition of retroversion, doubtless owing to the presence of a large intra-mural fibroid in posterior uterine wall. Ergot injections controlled the hæmorrhage and reduced it to a normal amount, though liable to recurrence when any unusual exertion was made. This patient's sister enjoys excellent health, and entered the married state for the first time at fifty, though for the past twenty-five years she has been encumbered with an enormous uterine fibroid, reaching far above the umbilicus.

Case VI.—Patient unmarried, aged twenty-five, sought advice in an extremely anæmic condition owing to repeated uterine hæmorrhages. The uterus was found extending far above the pubis, apparently having a fibroid in fundus and anterior wall. She attended very irregularly, and lived under very unwholesome conditions—sometimes suffering from want of suitable nourishment. When the injections had been used for some time sloughing of a portion of the tumour ensued, followed by prolonged purulent discharge from the uterus. She was ultimately discharged in good health, the uterus being reduced nearly to normal size.

This case very well illustrates the dangers which may arise in the course of this treatment, and which I admit we may be unable sometimes to foresee or prevent. Yet I believe their occurrence is greatly favoured by a depraved state of the general health.

Case VII.—Patient married, aged forty-one, childless; suffers from profuse menstruation and general nervous debility. A large subperitoneal fibroid was found, occupying chiefly the right side and fundus of uterus. Suffers from occasional attacks of hæmorrhage between menstruations. These have been markedly diminished by ergot injections, though not much effect has been produced on the menorrhagia.

Case VIII.—Patient married, childless; when young and unmarried this patient had suffered from dysmenorrhæa, which was, however, relieved by treatment. Later in life at the age of thirty-eight, when she had been some years married, she again consulted me, as menstruation had become profuse, and seemed likely to

become more so. The uterus was found to be somewhat enlarged and very resistant to the touch, suggesting the presence of an intramural fibroid. The ergot treatment had no beneficial effect in this case, so I removed the ovaries, and she has been quite cured of the menorrhagia, and the uterus has ceased to increase in size.

I have not combined the internal use of ergot with the injection of it in treating these cases, but I find that this is largely done elsewhere, as Winckel and others state—my chief reason for omitting its internal use being the difficulty of procuring a reliable preparation, and one not likely to derange the digestion and appetite. For injection I have for some years exclusively used the preparation originally made in America by Mr. Squibb, and which even now can only be procured at one establishment in London. The B. P. preparation I regard as almost worthless. If these brief notes form a subject for discussion, and elicit the opinion of the other members of the Section, my object will have been attained.

Dr. A. J. Smith said that at the present day, when one hears so much of operative gynæcology, it is in some cases useful to adopt less dangerous methods. The list of cases—small though it was—brought forward by the President showed that there are a certain number of cases which can be benefited by the hypodermic injection of ergot. It was remarkable that in his cases the women were nearly all at the centre of their child-bearing period. His own experience with regard to ergot hypodermically for these cases was unfavourable. When Assistant Master of the Rotunda he had tried it regularly in two or three cases without benefit, and the local annoyance following the injections rendered the patients' lives miserable. He would like to ask the President in what class of cases he would recommend ergot hypodermically.

Dr. Atthill said that he had given this treatment a fair trial in the Rotunda many years ago and had been unfavourably impressed by it. He had found local abscesses which caused considerable trouble to follow his injections. He had used three

preparations, none of which were "Squibb's," which was not then in existence. He had employed it in one remarkable case. There was a large fibroid projecting into the interior of the uterus. He dilated the uterus and removed a large portion of it. He then gave the patient ergot hypodermically. This caused such violent pains that he was forced to give it up. He concluded that ergot will not originate uterine contraction in a healthy woman, but that it will do so where there is a mass in the womb ready to be expelled. In consequence, he had given ergot in all cases of threatened abortion. If it does not expel the ovum it acts as a tonic to the uterus.

Dr. Purefoy, in reply, stated that this treatment was useful for that class of patients who were scared by the very mention of the word operation, and also in those cases in which the fibroid was intra-mural and not projecting into the cavity of the uterus in a polypoid form, nor existing as a pedunculated sub-peritoneal fibroid.

OVARIOTOMY PERFORMED ON AN INSANE PATIENT, EXEMPLIFYING ALSO THE LIFE HISTORY OF AN UTERINE FIBROID.

By LOMBE ATTHILL, M.D.;

Ex-Master of the Rotunda Hospital, Dublin.

[Read in the Section of Obstetrics, March 9, 1894.]

ALTHOUGH we frequently have patients under observation for years in whom the uterus is the seat of a fibrous tumour, it is seldom that an opportunity is afforded of watching its development from almost its earliest stage till it attains its maximum size, during which we have to combat the various distressing, and, indeed, often dangerous symptoms it gives rise to; then to witness the retrograde metamorphosis which generally commences after the climacteric period is reached; and finally, to verify the fact that the tumour has disappeared, and that the uterus has been restored to almost its normal state. It is mainly because it has fallen to my lot to witness all these phenomena that I bring forward the following case:—

A lady, married some fifteen years, and then aged about thirty-seven, came under my care in 1882. She had never been pregnant, and had enjoyed good health till about two years previously, when, having gone through a period of great mental anxiety, she began to suffer from slight attacks of hæmorrhage, which came on whenever anything occurred to worry or excite her. These sometimes were profuse, probably marking the menstrual periods; but of this she could not be sure, as they recurred irregularly.

On examining her I found the fundus to be enlarged and retro-

flected, while a small polypus projected from the os uteri. The diagnosis I made at the time was "cervical polypus and probable uterine fibroid." I removed the little polypus, and put her on ergot, but no benefit resulted, and the hæmorrhages became even more profuse. I therefore dilated the cervix, but there was no intra-uterine growth, so I curretted and applied nitric acid freely, and subsequently injected iodised phenol into the cavity. The result of this treatment was that the irregular hæmorrhages ceased; but menstruation recurred too soon, and was very profuse and weakening.

For the nine following years I saw this lady frequently. The uterus steadily increased in size, and became nodulated, thus confirming the original diagnosis that its wall was the seat of a fibroid. Finally it attained the size of the fœtal head at full term, the fundus reaching nearly to the umbilicus, and friends supposed from her figure that she was pregnant; then she became insane, and was admitted into an asylum, and I lost sight of her.

More than once I had suggested operative interference, for the hæmorrhages were sometimes alarming, but the suggestion would not be listened to. A few weeks ago I was requested to visit this lady in the asylum, the reason being that the abdomen had recently increased rapidly in size, though she herself had become extremely thin. I should say that since she became insane great difficulty had been experienced in getting her to take food.

On visiting her I was told that she had ceased to menstruate soon after her admission into the asylum two years ago. The abdomen was occupied by a large fluctuating cyst, the fibroid which used to be so prominent could not now be felt, and the only question was whether a cyst had been developed in the fibrous tumour whose growth I had so long watched, or was it a recently developed ovarian one. I believed it to be ovarian, but the patient resisted so vigorously that unless under the influence of an anæsthetic anything like a satisfactory examination was impossible.

The attendants were so clear, judging from her size, that the tumour was increasing rapidly, that I advised that she should be ready for the performance of an abdominal section, if when in an insensible state that seemed advisable, that point to be decided at the time. The patient's mental condition was such that I considered the administration of an anæsthetic twice should, if possible, be avoided.

Her friends agreeing to my suggestions, she was brought

under the influence of chloroform without trouble, and then the existence of a large ovarian cyst was verified, but no trace of the fibroid could be made out. Ovariotomy was rapidly and easily performed, there were a few adhesions anteriorly, the pedicle was long and easily secured, and the tumour was removed. Then we proceeded to examine the state of the uterus; it was but little larger than it should have been in a woman of her age (forty-nine), and no trace of the nodulated tumour so easily traced three years before could be felt. The rapid atrophy of this tumour was most probably accelerated by, and no doubt in part the result of the insufficient quantity of food she had consumed since she became insane. As already observed, there had been a constant difficulty in getting her to take food, and the one great complaint she made to me was that "they were always forcing her to swallow food." This fact confirms the truth of a rule I have always laid down in the treatment of bleeding fibroids—namely, that it is unwise for such patients to take large quantities of nutritious foods. If you feed highly more blood will be manufactured, the more rapidly will the tumour grow, and the greater will be the loss of blood, specially during the menstrual periods. Moderate, unstimulating diet, and abstinence from spirits, wine, porter, &c., should in general be the rule in such cases.

This patient made a rapid recovery, and though very restless, even to the extent of sitting up in the bed frequently during the very day on which the operation had been performed, she had no bad symptom. Her friends hope the operation may result in the improvement of her mental condition; but I fear that these hopes may not be realised. Her general health certainly is, at the end of only a few weeks, decidedly better, and she takes food comparatively freely now.

Dr. A. J. Smith remarked that it was a very early age for a uterine fibroid to disappear. Usually the climacteric period was delayed. He knew that Dr. Savage had performed several ovariotomies on lunatics, but without satisfactory results as regards their mental condition.

Dr. Atthill, in reply, stated that the operation was done merely to prolong the patient's life. He did not expect any improvement in her mental state, as she was sullen, and improvement, if it is to be looked for, should occur in women who have sexual desire. This patient had not any. The early atrophy of the uterus, he thought, could be explained by her emaciation. When she became insane it was with great difficulty she could be induced to eat.

RUPTURED TUBAL PREGNANCY, WITH INTRA-PERITONEAL HÆMORRHAGE, SUCCESSFULLY TREATED BY ABDOMINAL SECTION.

By ALFRED J. SMITH,

Ex-Assistant Master, Rotunda Hospital;
Examiner in Midwifery, Royal University.

[Read in the Section of Obstetrics, April 13, 1894.]

The number of successful operations for the radical cure of ruptured tubal pregnancy, where the hæmorrhage was peritoneal, have been extremely few in Ireland; in fact, I can only find a record of two—one by Dr. Smyly, Master of the Rotunda, and the other by Professor Byers, of Belfast. Their limited number, therefore, must be my apology for placing before the consideration of this Section of the Academy a detailed report of a successful case treated by me in my gynæcological wards in St. Vincent's Hospital. On the 22nd of March last I was asked to see a case in one of the suburbs of Dublin. On arrival the patient told me that her age was thirty-six, that she had been married fourteen years, had two children born at full term alive and healthy. The younger child was eight years old. There was an adherent placenta after the birth of the last child; its removal was followed by a septic fever which invalided the patient for three months. Then followed six miscarriages at about the third month, with intervals between the abortions of from nine to fifteen months, the last abortion being in October, 1892. In the June following—*i.e.*, in the June of last year—her uterus was curetted; since then her changes were quite regular as to time, but lasted about seven days; they were accompanied by pains of a

bearing-down character. Her changes in last December and January were quite as usual, but the changes which came on at the beginning of February began without any unusual pain and continued without intermission up to March 22nd. She put off consulting a doctor from day to day, and sought my advice only because a dose of salts taken in the early morning had not acted, and that for the first hour or so before my arrival she complained of severe griping pains in the abdomen, and a feeling as if there was some lump in the back passage which caused a constant desire to stool, but without any result. The patient looked more unwell than her symptoms accounted for so I ordered her at once into St. Anne's ward at St. Vincent's Hospital.

On visiting the hospital next morning, Good Friday, I was struck at once by the great pallor of the patient; the small quantity of blood discharged per vaginam could not account for her serious condition. Pulse feeble, 120. Temp. 99° F., lips blanched and pupils dilated. External palpation revealed a uniform tenderness over the lower part of the abdomen. A point of maximum intensity could not be ascertained; no dulness on percussion.

Examination per vaginam by the bi-manual method was decidedly unsatisfactory, as it had to be made in the ordinary ward bed, and the extreme weakness of the patient prevented a thorough examination. The points noted were: the uterus felt apparently normal as to position, but slightly anteposed; the fundus enlarged and soft; the posterior *cul-de-sac* felt boggy and bulged into the vagina. I could not form any opinion as to the condition of either broad ligament. But the conclusion was forced on my mind that I was dealing with a case of intra-peritoneal hæmorrhage, most probably caused by the rupture of a tubal pregnancy and not a collapse from fæcal impaction, and I determined

to operate at once. Mr. M'Ardle kindly saw the case with me and urged the advisability of immediate operation.

The patient refused to be operated on without her husband's permission, and three valuable hours were lost before he could be communicated with and his permission obtained. To such a low condition was the patient run that I had to perform the abdominal section in her own bed in the large ward. Mr. M'Ardle gave me his valuable assistance, and Dr. Anderson, house surgeon, administered ether.

An abdominal incision to admit three fingers was made in the usual situation. The anæmic appearance of the wound was remarkable. On opening the peritoneum blood welled up in great quantity and established the diagnosis. The pelvis was full of tolerably firm blood clots, which had become more or less adherent to the pelvic organs, and caused some difficulty in making out from which broad ligament the hæmorrhage was coming. On satisfying myself that it was from the left side, I passed a stout silk ligature through the broad ligament close to the uterus with Tait's needle and tied firmly. Having thus controlled the hæmorrhage I proceeded to remove the blood clots, removing large quantities by aid of the fingers and a sponge. This method I found too slow, so I employed the douche, using a saline solution of ordinary refined household salt in the proportion of one tablespoonful to one gallon, and at a temperature of 99° F. The stream of water was directed against the bottom of Douglas' pouch, the height of the douche can being 2½ feet, and then, with the aid of my fingers, the clots were floated out quickly. I now changed the patient to a Trendelenburg's table, so as to see better what I was doing. It was noted the inverted position was of much benefit to the patient; her pulse, which was almost imperceptible in the wrist, returned. Then I tied the broad ligament by the usual double ligature

and removed the ruptured tube and ovary [specimen here shown]. The right Fallopian tube and ovary were examined and found normal. The pelvic cavity was again douched out with the warm saline solution; the excess of fluid was not aspirated, but was left in to be absorbed by the peritoneum. A Keith's glass drainage-tube was inserted, and the abdominal wound was closed by interrupted silk sutures.

On lowering the Trendelenburg's table and transferring the patient to the bed a marked effect on the circulation was observed; the pulse apparently dying out, its volume returned as soon as the patient had an enema of a pint of the saline solution, to which 30 drops of laudanum were added; it was necessary again to slightly invert the patient by an arrangement of pillows placed under her hips and raising the end of the bed.

The after-treatment differed from ordinary abdominal sections inasmuch as the patient was allowed within the first twenty-four hours to drink as much milk, well diluted with hot water, as she wished; also weak hot tea. On the second day she had an egg-flip, beef-tea, &c., without any trouble following. Stimulants were administered per rectum. Bowels moved without medicine on the third day. The drainage-tube was removed on the fourth day after the operation.

Her recovery was not perfectly afebrile, as an attack of pneumonia, confined to the base of the left lung, supervened on the second day, the temperature rising to 102° F., pulse 118, the sputum being characteristically rust-coloured. In treating this complication I had the benefit of my colleague's, Dr. Cox's, opinion, who states that there is also distinct evidence of a phthisical cavity at the apex of the left lung. Notwithstanding these serious complications, the patient is doing extremely well.

I am glad to be able to state that she was able to leave her bed this morning, just three weeks since the operation.

Pathological examination of specimen by Dr. Glasgow Patteson, Pathologist to the Hospital.—The specimen consisted of the left ovary, tubo-ovarian ligament, the outer two-thirds of the Fallopian tube, and the portion of the broad ligament which had been embraced in the ligature. The ovary was enlarged to about twice its normal size, and section revealed—what had been evident on palpation—the presence of a cyst about the size of a cherry, which was filled with a milkish opaque fluid, and had adherent to its walls a quantity of semi-opaque gelatinous material which, examined microscopically, was found to consist of a homogeneous, granular, and fatty *débris*, most probably epithelial in character. The cyst was definitely enclosed in a fibrous capsule. The inner portion of the tube was considerably enlarged in size and presented signs of inflammation; while the outer portion of the tube showed that the fimbriæ had to a large extent become obliterated by adhesions, and that these had subsequently to a large extent been broken down by a rupture which extended for about an inch along the tube internal to the ostium. This ruptured cavity presented very ragged walls, the normal epithelium being totally destroyed and the surface covered with irregular shreds and tags of inflammatory material or coagulated fibrin. There was no trace of an ovum in the tube, nor any sign of commencing formation of membranes, though on this point I cannot speak with certainty, as the specimen had undergone considerable maceration in weak spirit, and the time at my disposal was too short to allow of a microscopic examination.

All the blood-clots removed from the pelvic cavity were preserved and carefully searched without finding any fœtus. From the pathological report just presented to you I consider

that what doubtless took place soon after the adhesion of the ovum near the ampulla of the tube is that the fimbriæ closed over it and became adherent to one another, as they may be constantly seen to have done in cases of non-adherent hydrosalpinx, and the subsequent disseverance of the fimbriæ constituted the rupture. The absence by macroscopic examination of any evidence of the fœtus is a matter of frequent occurrence in Fallopian pregnancies occurring in the outer third of the tube on account of the early period of their rupture, about the sixth week. A very interesting query—Is this case an example of complete "tubal abortion" in ectopic gestation?

Remarks.—Some points of special interest occur to me as worthy of note in reviewing this case—namely, the complete absence of any history of pregnancy, or the shedding of any decidua from the uterus. These two facts, coupled with the constant ineffectual effort to stool, might easily lead to a serious error in diagnosis.

The case also illustrates the value of—

1st. Trendelenburg's table.

2nd. The use of saline solutions for peritoneal douche or enema in cases of severe hæmorrhage.

And, lastly, that our after-treatment in abdominal sections can be guided by rational methods, and that it is not necessary to follow slavishly the old starvation process.

Dr. More Madden, having congratulated Dr. Smith, said that it was a most interesting feature in the case that no fœtus could be found. The embryo usually escapes into the peritoneal cavity and perishes. Cases of tubal pregnancy are more frequent than is usually supposed.

Dr. Smyly said that success in these cases depends upon decision. The most difficult part of the operation is to decide to open the

abdomen. When you are called to see a lady who, a few hours previously, was in perfect health, and who was seized with a fainting fit, you naturally hesitate to operate, hoping that, as sometimes happens, she may get all right, and then perhaps when she gets another fainting fit you imagine that the time for operation is past. He was astonished at the number of tubal pregnancies he had seen when in Berlin. An assistant in one of the hospitals told him that they got one on an average every fortnight. He thought Dr. Smith's case to be a typical one of "tubal abortion."

Dr. E. H. Tweedy said that flushing out the abdomen with hot water added to and never lessened the shock attending abdominal operations.

Mr. M'Ardle said that it was well before inverting the patient to remove as much blood-clot as possible from the pelvis and abdomen.

Dr. Bate asked Dr. Smith did he think there was any connection between the tubercular disease of her lungs and the ruptured tube.

Dr. Smith, in reply to Dr. Bate, said he really could not tell. He said that it was a curious fact, and perhaps it was only a coincidence, that all the patients suffering from tubal pregnancies of whom he had any record had been curetted some six or eight months previously. In this operation he had not used *hot* water, but saline solution of the temperature of the body. A marked improvement in the circulation followed its use.

NOTES ON A CASE OF HEMI-ENCEPHALOID FŒTUS.

By WILLIAM J. THOMPSON, B.A., M.B. Univ. Dubl.;
L.R.C.P.; L.R.C.S.;
Demonstrator of Anatomy, Royal College of Surgeons.

[Read in the Section of Obstetrics, May 18, 1894.]

On the 26th April, I was asked to see Mrs. M. The following are the notes I made of her condition:—

Age, forty-three; married ten years; mother of three children, two living, both strong and healthy; last child born three years ago, had very large spina bifida, and died after two days. Now seven and a half months pregnant. She complained of premonitory parturition pains, and was troubled with a constant hacking cough, followed by fœtid expectoration. On examination, I found her thin and emaciated, cardiac sounds feeble, but normal; both lungs in a state of advanced phthisis; no sign of approaching parturition. The abdomen was very large for a seven and a half months' pregnancy.

I did not see the patient next day; but on the following morning I was hurriedly sent for at an early hour. On arrival, I found that an unusually large quantity of amniotic fluid had escaped a couple of minutes previously. The head of the hemi-encephaloid fœtus, now before you, was just at the vulvæ. Complete delivery was rapid, and the placenta was expelled in the ordinary time.

The fœtus breathed once or twice after expulsion, and the mother affirms she felt its movements up to the last. It will be seen to be a typical specimen. The face is perfectly developed—mouth, tongue, nose, and eyes. The vertical portion of the frontal bone, the two parietal bones, the squamous portion of the temporal, and all the occipital bone (except the base) are wanting. The cervical vertebræ are normal. There is no spina bifida or talipes, which is usual in such cases.

I have made the following dissection:—First, of the anterior portion of the body, and find a right rectus sternalis muscle well

developed, and very well shown. This muscle is rarely found in the dissecting-room, but in malformations it is quite common, five out of every six fœtuses having it. In the thorax the only thing worth mentioning is that the thymus gland is much smaller than it should be. In the abdomen all the viscera are perfect except that the supra-renal capsules are exceeding small. Normally, in a fœtus of this age the supra-renal capsules are as large, if not larger, than the kidney. The uterus and appendages are normal. I have exposed the spinal cord, and you can see all the spinal nerves perfect. Both the lumbar and cervical plexus are well developed and very large. The remains of the brain are found in a red vascular-looking mass, situated in the base of the skull, and a large number of the cranial nerves are to be seen making their exit through the ordinary foramen.

In treating of malformations in general, a distinct line can be drawn between simple and compound; the former have one or more of the organs or parts defective or wanting, the latter have some parts or organs more than that of a single individual. Of single monsters there are a number of forms that can be referred to cleft malformations or those that result from non-closure of the parts of the body open in early stages of embryonic development, but which later on become closed. Cleft and fissure abnormalities may occur along either the dorsal arches or any portion of the anterior arches. Sometimes the opposite of cleft malformations occur, in which the closure of any of these arches is premature.

As regards the causes of malformations, some believed that they were due to maternal mental emotions or impressions. This theory is, of course, long since exploded, and justly so, for monstrosities occur comparatively seldom, probably once in three or four thousand births, and it is beyond question that only such a proportion of pregnant women are subject to severe frights, &c. Others maintained that it was the original germ that was already defective before development or growth began. It was not until the

researches of Bichat in creating the science of histology, and so reducing the complex structures of the body to their elementary tissues, that the present theory of anomalies and monstrosities was founded—viz., "that of arrest and retardation of development or of excessive formative energy," and the explanation of why these occur is the same as that of the pathological influences which occasion morbid changes in the body after birth.

It is interesting to note that it has been observed by eminent embryologists that the transient form of the human embryo in its several stages of evolution bears a striking resemblance to the types of the lower order of animals; hence the human monstrosities very often resemble the appearance of brutes, and those of brute types of animals lower in the scale.

OBSERVATIONS ON THE ÆTIOLOGY, PREVENTION, AND TREATMENT OF PUERPERAL SEPTICÆMIA.

By THOMAS MORE MADDEN, M.D., F.R.C.S. Ed.;
Obstetric Physician and Gynæcologist, Mater Misericordiæ Hospital;
Consultant and Ex-Master, National Lying-in Hospital.

[Read in the Section of Obstetrics, May 18, 1894].

RECENT bacteriological investigations have apparently brought us within such a measurable distance of accurate knowledge of the general causation and prophylaxis of puerperal fever or septicæmia as will probably result in a corresponding advance in its treatment. Nevertheless, on all these questions there still remains, as proven by the deaths recorded from infectious puerperal disease in the latest Annual Reports of the Registrar-General, abundant need for all the light that can be thrown on this subject by clinical experience as well as by scientific research.

From the former standpoint, therefore, and with the object of some possible practical utility, rather than that of any useless attempt at novelty, which would be almost impossible concerning a topic so trite and often discussed as this, I now submit the following observations, founded on a long and familiar acquaintance with puerperal fever in hospital or consultation practice, in the hope of also eliciting the opinions and experience of other members of the Academy on several questions of no little importance.

Before referring to the causes and forms of puerperal septicæmia, which, together with their prophylaxis in each instance, I purpose very briefly to consider *seriatim*, it should, perhaps, be premised that under this term may be here

included all those forms of infectious pyrexial disease that are directly consequent on parturition and peculiar to the puerperal state, or which then assume a specific character. Hence the older expressions puerperal, or lying-in fever, metro-peritonitis, metria, &c., should be considered merely synonyms for a disease, or group of diseases, the characteristic of which is an infective affinity for the puerperal state, the varying phases and different symptoms of septi cæmia in successive epidemics being chiefly ascribable to the special circumstances, hygienic surroundings, and constitutional condition of the patients in each instance, as well as to the source of the septic matter, or pathogenic micro-organisms, in which must be sought the *fons et origo* of each and every type of puerperal fever.

Ætiology of Puerperal Septicæmia—Bacteria.—The classification of the microbes or germs in which we now recognise the starting-point of septicæmia after child-birth is, however, a question which, as yet, is by no means definitively settled. As Dr. Manton, of Detroit, has observed in an able *résumé* of the modern literature of the subject, although "many workers are in the field endeavouring to discover a special germ of puerperal infection, no great addition has been made to our positive knowledge of the subject. The great difficulty lies in the fact that apparently the same micro-organisms found in septic infection are also found in a variety of other morbid conditions, and even in the healthy body."

Smith has discovered in cultures from the heart-blood of a woman dead of "puerperal fever" a streptococcus which he believes to be specific, as the same organism was found in blood taken from the finger of a woman suffering from puerperal septic infection. He states that his germ differs essentially from all other streptococci, and from those described by Fehleisen and Rosenbach. Lustig has also

demonstrated a streptococcus in the blood from the heart and spleen of a woman who died from septic endometritis and peritonitis, but concludes that the organism is identical with that of Fehleisen. Clivio and Monti have published similar observations. Bumm states that the micro-organisms which cause the infectious form of puerperal fever are almost exclusively the chain micrococci, which are identical with the streptococci of ordinary wound infection. He believes that the differentiation of streptococci into Streptococcus erysipelatis, &c., is purely artificial, as no morphological or biological differences exist between the streptococci of phlegmon, of puerperal septicæmia, and of true erysipelas. Widal concurs in this opinion, as he has found the Streptococcus pyogenes not only in septic infection but in erysipelas, suppurative pleuritis occurring in the puerperium, and other conditions.*

The investigations thus summarised sustain the opinions which I have before expressed from evidence furnished by the history of epidemics of puerperal fever that in my own day, and previously from time to time, have prevailed in the Dublin, as in all other, lying-in hospitals—viz., that puerperal septicæmia may result from infection with the poison of various zymotic diseases, such as erysipelas, scarlatina, and typhoidal fevers, as well as from contagion transmitted from other patients suffering from puerperal fever.

"Researches into the germ theory of disease," as Dr. Kinkead says, "would seem to support this view. Thus it is stated that micro-organisms of one group may, by development, change into one of another group—a micrococcus developing into a bacterium, this into a bacillus, and this again into a spirillum. Buchner believed that, by changing the nutritive soil, the micro-organisms could be altered. His

* Puerperal Diseases. By W. P. Manton, M.D., in Annual of Universal Medical Sciences, Vol. II. Philadelphia. 1890.

experiments are looked on as uncertain, because he used in some of them blood; but blood could hardly be a more impure cultivator than the fluids of a puerperal woman. According to Wernich, an innocent bacillus may develop into a typhoid one, and it appears probable that it is the condition of the virus which determines the form of the disease set up by the micro-organism."[a]

Traumatic Causes of Puerperal Septicæmia.—Amongst the channels through which bacteria may invade the puerperal system not the least important are traumatic lesions of the genital tract, such as lacerations of the perinæum and cervix uteri and vaginal abrasions from parturition, however slight or unrecognised their extent may be. Nor should it be forgotten that such lesions, as shown by Leopold,[b] are not unlikely to become the avenues of puerperal infection originating in the introduction, by careless examination or otherwise, of purulent or gonorrhœal matter, dirt, urine, fæces, or vulvo-vaginal discharges, which may contain pathogenic micro-organisms or germs.

Under these circumstances the importance of thorough cleansing of the genital tract by hot water irrigation, preferably medicated with some safe and effective antiseptic, such as boric acid (1 in 25), or carbolic acid (1 in 40), or lysol (1 in 100), immediately before as well as after delivery, is apparent. Nor less obvious is the necessity for the strictest asepsis in the management of every stage of labour, as well as of the puerperium, to prevent the consequence of infection through the hand of the midwifery attendant. For the prevention of this danger more, however, is required than the routine practice now relied on by some practitioners and nurses of dipping their hands (not impossibly previously uncleansed) in corrosive sublimate or other antiseptic solution,

[a] American Journal of Obstetrics, 1884.
[b] Leopold. Centralbl. für Gynäk., No. 29, 1892.

which is apparently regarded, by recent authorities, as the essential precaution to be universally resorted to. The employment of antiseptics is unquestionably useful, and I yield to no one in my appreciation of their value as adjuncts to asepsis, but they can never replace the latter, and without it are, *per se*, probably of about as much utility as the "Fetish of an African medicine man" might prove under similar circumstances. The one effective prophylactic for the purpose now referred to is cleanliness, and this should be secured by long and careful hand-scrubbing in clean hot water with nail brush and soap (if strong carbolic soap, so much the better), until perfect asepsis is attained; after which the hand may, and should, be immersed in an antiseptic solution, before each and every vaginal and uterine examination or contact with the lying-in patient.

Auto-infection, as it was termed, although no longer holding the position formerly assigned to it in the ætiology of puerperal fever, cannot be wholly dismissed from consideration as a possible factor in the causation of the disease. To this source of puerperal fever should, I think, be attached a greater importance and a different significance than that assigned by Waltenbach, who defines auto-infection as "a process in which the micro-organisms which are present in the genital secretions before labour develop virulence." If this view be a correct one it should lead us to rely on the systematic use of antiseptic vaginal injections, for some time previous to the expected date of labour, as the most effectual prophylactic of auto-genetic puerperal fever; but this conclusion is not borne out by experience.

According to Dr. Herman, the results observed in hospitals where that practice was followed have not proved better than those attained without it, and as the same writer concludes: "The usefulness of vaginal injections before delivery is theoretically not shown, practically not proved; moreover,

such injections may be the means of doing harm, and, therefore, midwives should not be taught to use them." Moreover, if, as Bokelmann points out, no one has demonstrated pathogenic germs in either the ante- or post-partum vaginal discharges of a healthy woman, the preparatory disinfection of this passage cannot be necessary in such cases.

It does not, however, appear to me requisite to admit the existence of pathological microbes in the ante-partum vaginal secretions of a healthy woman to understand the occurrence of so-called auto-genetic puerperal fever—the more probable explanation of which may be found in the decomposition of retained puerperal discharges, clots, membranes, or placental *débris* into which infective micro-organisms have gained access.

For the prevention, therefore, of such infection all those details of skilled nursing, by which the nearest approach to asepsis may be attained in the general management and surroundings of the lying-in patient, are of vital importance; nor is it beneath the practitioner to see that these precautions are properly carried out by the nurse, and that throughout the puerperal state the genitalia are kept as free as possible from sepsis by frequent and systematic antiseptic ablutions. For this purpose the sponges which are still too frequently used in the puerperal toilet should, of course, be replaced by wood wool pads that can be thrown into the fire immediately after use, and the linen diaper superseded by the sanitary napkin of the same material that can be similarly destroyed. The excreta should be received in utensils containing chloride of lime or izal, and at once removed from the lying-in room, for the perfect cleanliness of every part of which the nurse should be made to feel herself under the ever-watchful supervision of the obstetrician.

All such attention to external cleanliness will, however, avail little for the prevention of puerperal septicæmia if the

complete asepsis of the internal genital tract be neglected. With this view the importance of favouring natural drainage, or escape of utero-vaginal discharges—which, as Dr. Goodell, of Philadelphia, and Dr. Duke, of Cheltenham, have shown, may be facilitated by departing from the routine maintenance of the horizontal position, which is frequently too rigidly or too long enforced during the puerperium—must commend itself to every obstetrician, no less than the advantages obtainable from thoroughly washing away from the parts all such possibly pent-up discharges by efficient local antiseptic flushing by the uterine irrigator.

Whether the latter practice is universally necessary or not after perfectly normal labour there is still difference of views; nevertheless, with some eminent exceptions, the consensus of modern opinion is in its favour as a general rule of practice and when not specially contra-indicated. There can, however, be "no possible doubt whatever" of the absolute necessity of thus washing out the uterus as well as the vagina in every instance of deviation from the course of natural delivery that has called for instrumental or manual interposition, or where labour has been unduly protracted, or the expulsion of the placenta delayed, or the soft parts injured; as well as in cases where, either from too frequent or careless examinations, or the general condition of the patient, or of her surroundings, there has been any special probability of the admission of sepsis. Under all such circumstances, unquestionably the uterus should be thoroughly flushed out immediately after delivery with hot water (120°), medicated with some suitable antiseptic, by means of the irrigator, and never by the ordinary siphon syringe.

The last-named instrument, though still in common use, is, in my opinion, decidedly unsafe when employed for the purpose now referred to, as exemplified in the cases which

I have elsewhere recorded, in which fluid thus injected was forced, with serious consequences, into the peritoneal cavity through the patulous Fallopian tubes, or into the general circulation through the still open uterine sinuses. Hence I would again counsel the complete disuse of the ordinary syringe in midwifery practice and recommend in its stead the employment of an irrigator such as that here shown, which I first exhibited in this hall nearly twenty years ago, and which, since then, has been reproduced by others as an appliance by which the necessary washing out of the uterus after parturition may be more safely as well as effectually accomplished. To thus cleanse out the uterus, pure hot water, if properly employed in sufficient quantity and at a sufficiently high temperature—viz., 120°—may probably in most instances be found as efficient as any of the antiseptic solutions in general use, and has the advantage of being procurable when no antiseptic may be obtainable. This is, however, seldom the case, and where we have the power we are, I think, bound to employ an antiseptic, and in so doing to consider not only the potency of its germicidal action but also the safety of its use. Of these agents, for the purpose under consideration, I myself therefore prefer either a one in fifty or sixty solution of carbolic acid or a saturated boric solution (℥ss. ad O.), or turpentine (ʒss. ad O), or some one of the still milder disinfectants, such as a ten-volume preparation of peroxide of hydrogen, or Condy's fluid, or sanitas, in preference to corrosive sublimate solution for intra-uterine flushing. The latter, although possibly the most active and generally employed, is, in my opinion, the most hazardous to the patient of all germicides used in obstetric practice. If so employed at all, the solution of bichloride of mercury should never be stronger than 1 in 2,000, which is sufficiently germicidal, whilst of course less liable to produce those toxicological and fatal effects that

have followed the use of the much stronger solutions (such as 1 in 1,000 or even 1 in 500), recommended by some authorities, of this unsafe uterine antiseptic, the obstetric use of which should, I think, be chiefly restricted to ablutions of the external genitalia.

Atmospheric, Epidemic, and Endemic Causes of Puerperal Fever.—Besides those sources whence the infection of puerperal septicæmia may invade the utero-genital organs already predisposed by recent parturition for its reception and development, the germs of the disease may also be introduced through other channels into the system of the lying-in patient. Firstly, this may occur from what the older writers aptly termed the "prevailing epidemic constitution of the atmosphere;" or, as Dr. M'Clintock expressed the same idea, from "certain states of the atmosphere which powerfully influence the extension of zymotics, either by favouring the spread or transference of their respective contagia, or by disposing the constitution to their receptivity." Secondly, puerperal fever may be endemically occasioned by an atmosphere contaminated by septic or malarial emanations, sewer-gas, or otherwise, as well as directly from disease germs evolved from other patients in the same locality. The potentiality of the first-named causes of puerperal fever is strikingly evinced in the history of several epidemics of this disease which in former years, at times when other zymotics, such as typhus fever or erysipelas, were also epidemic, broke out in Dublin, and then manifesting an intensity of virulence now fortunately unknown, repeatedly decimated the wards of the lying-in hospital. Moreover, the area over which the disease then extended was so large, and the number of patients thus simultaneously affected in different districts so great, as to preclude the possibility of its prevalence being ascribable to any personally transmitted contagion, and supporting the view that both contempo-

raneously prevailing epidemics were modifications of the same virus and were consequent on the same "generally pervading atmospheric influence."

Atmospheric contamination by sewer-gas, as a cause of puerperal septicæmia, is a more important, because preventable, matter for consideration than that last referred to. Nor is it confined, as some think, to the unsanitary and squalid dwellings of the poor. On the contrary, the worst cases of septicæmia that have come under my observation in consultation practice have been in patients of the wealthiest class, whose rooms, fitted with the most costly appliances of so-called sanitary engineering, were actually less sanitarily circumstanced than the tenements of the poor around their mansions, being in direct communication, through bath-room or closet, with sewer pipes, the defective arrangements of which proved veritable death-traps for such patients. As Dr. Handfield Jones observes: "On the question, however, of puerperal poisoning due to bad sanitary surroundings, much has yet to be learnt. . . . In what manner the foul material gains access to the patient's body, whether by the respiratory tract or otherwise, may for some time be a debated question; but there can be no doubt that this form of septic intoxication does actually exist. Probably most practitioners know of cases in which patients, whose lying-in chamber was in close proximity to bad drains, privies, slaughter-houses, or other sources of foul emanations, have suffered for some weeks from delivery from pyrexia, fœtid discharge, and other signs of poisoning. In all such cases the remarkable clinical fact is this—viz., that while douching, quinine, and other remedial means have no effect on the diseased condition, recovery rapidly takes place when the patient is moved into some sanitary dwelling. Numerous cases could be quoted in support of this assertion."[a]

[a] Vide The Year-Book of Treatment for 1893. P. 368.

Lying-in Hospitals.—It would be impossible to discuss the ætiology of puerperal septicæmia without some allusion to the occasional influence of lying-in hospitals in the epidemic spread of the disease. In such institutions it has been repeatedly observed that epidemics of this kind were traceable to one—and that possibly a mild—case of puerperal fever in a ward, which was followed by the epidemic prevalence therein of septicæmia in an increasing virulence of type and fatality, and often necessitating for its arrest the temporary closure of the maternity. This fact sustains the view that in hospitals where considerable numbers of puerperal women are segregated, what was formerly termed a "puerperal atmosphere" is liable to be created and to linger, in which the germs of septicæmia may for a time remain latent, until eventually, under certain ill-defined conditions, they may suddenly develop special infective activity and virulence. The risk of these consequences can, however, as recent experience here and elsewhere has shown, be largely obviated by judicious precautions. Firstly, therefore, no ward should ever be occupied by an uninterrupted succession of lying-in patients; secondly, after each fresh batch of obstetric cases the ward should be thoroughly cleansed and disinfected; thirdly, the purity and sufficiency of air, so essential for this class of patients, should be duly secured by efficient ventilation and the avoidance of any overcrowding in the wards thus occupied, in which no puerperal patient should be afforded less than 2,500 cubic feet of space.

Prophylaxis of Puerperal Septicæmia before Delivery.—Having already dwelt sufficiently on the vital importance of strict asepsis in everything appertaining to the lying-in patient and her surroundings, and the means by which it may be secured during labour and in the puerperal state, it only remains for me in this connection to glance briefly at the precautionary measures which should be taken before

delivery for the prevention of subsequent septicæmia. To minimise the risk of this as far as possible is obviously a primary duty of every practitioner who accepts an obstetric engagement. I may therefore here repeat that if the obstetrician has any voice, as he should have, on such a matter, he cannot use it better than in urging his patient to select for her confinement a room apart from any possible communication, by lavatory or otherwise, with the sewerage of the house. That apartment should, moreover, be as large, well ventilated, sunny in aspect, and scrupulously clean as can be obtained. Without going to the length of those who insist on stripping the lying-in room of nearly all the usual furniture and comforts to an extent calculated to increase the terrors of parturition and thus add to its dangers, it is desirable to free the room from any such superfluity of furniture as might materially interfere with the necessary respiratory cubic space, to clear it as far as possible from heavy curtains or hangings, and to see that the patient has a light metal bedstead with spring mattress for her accouchement.

During the latter months of pregnancy the patient should be, as it were, put in training for the coming event by careful attention to her general hygiene, diet, and evacuations, as well as by cheerful surroundings, mental occupation, and open exercise, so as to thus maintain her general health at the highest attainable level. In most cases, bearing in mind that the latter portion of pregnancy is physiologically an anæmic condition, that object may be also aided at this time by the administration of some ferruginous tonic, such as tincture of perchloride of iron. Finally, I may be permitted to add, although it hardly comes under the above heading, that after delivery the same remedy given in combination with liquor ergotæ in full and efficient doses will be found most useful (by securing contraction of the uterus, sealing the

vessels, and expressing discharges therefrom) in the prevention of puerperal septicæmia when employed in conjunction with the measures before referred to.

Treatment.—The therapeutics of a disease so complex in its pathology and many-sided in its forms and relations, cannot be discussed without reference to the special type of the disease and its predominant symptoms in each instance. To enter fully on so extensive a subject would be manifestly impossible within my present limits, but, without attempting this, I may at least reiterate that during my own experience the prevalent type or character of puerperal fever, and, consequently, its routine treatment, have varied widely in successive epidemics. For instance, in my student days metria, or septic metro-peritonitis, was the ordinary and too commonly fatal form of infective puerperal disease witnessed in the Rotunda Hospital, where it was then appropriately treated by mercurials, opium, and stimulants, together with local leeching and poulticing over the hypogastrium. A few years later, when I became one of the medical staff of the same hospital, the general form of puerperal fever, as noticed by myself during some very fatal epidemics, had changed from an inflammatory to a typhoid character, with little local pain or tenderness, but attended by great prostration, retching, diarrhœa, and occasionally low muttering delirium and other evidences of profound septic intoxication, in which no antiphlogistic measures, such as were previously adopted, could for a moment be thought of.

With some modifications the latter type of septicæmia, although in a lesser degree of intensity, has continued to the present time, when it very commonly presents a distinctly remittent character. In such cases, as I have more recently observed, the septic nature of the disease is clearly evinced by "spiking" clinical charts, exemplified by those here shown, which, especially in unfavourable cases, such as in

that of which the chart is now exhibited, present the most marked and sudden alternations of temperature—*i.e.*, from 105° or upwards to subnormal within a few hours—a circumstance frequently prognosticating a speedily fatal event.

Even in more favourable instances there are, as a rule, distinct daily remissions and remarkable alternations in pulse-rate and temperature. Thus, in some of these charts of cases in which patients recovered, yet, for instance, in the following, we observe a morning temperature of 99° or 100°, with a pulse little above normal, whilst on the same evening the pulse approximated it, or exceeded 120, and the temperature reached 104° or upwards.

Such symptoms obviously demand, in the first place, free stimulation and suitable nutrition; secondly, the exhibition of quinine both as an anti-periodic and as a possible germicide; and, thirdly, the removal of all removable septic matter from the internal genitalia by antiseptic flushing, or even in some instances, as recommended by Dr. Duke and others, by the use of the blunt uterine curette. The advantages of washing out the uterus under the circumstances referred to with either a ten-volume preparation of peroxide of hydrogen, or else a one in forty or fifty solution of carbolic acid, at a temperature of 115° or 120°, are incontestable, the result of thus flushing out a septic uterine cavity being apparent in many cases that have come under my own notice, in which this procedure was followed by subsidence of previously high temperature and pulse-rate, increase and improvement in the discharges, and a speedy amelioration in the aspect and general condition of the patient.

With regard to the more heroic surgical procedure that has been advocated, and in several instances successfully employed, in the acute local inflammatory forms of puerperal fever or puerperal metro-peritonitis—viz., resort to laparo-

tomy and washing out the peritoneal cavity—I need only observe that such operations, however useful in appropriate cases, are by no means frequently called for or justified in the present type of puerperal septicæmic fever that here comes under notice, in which the disease is now very seldom thus localised. Nor in any of the cases of the kind that I have seen of late years would the employment of cold baths or affusion as a puerperal antipyretic, which has been recently revived in Australian practice[a] as a remedy for puerperal septicæmia, appear to me admissible.

Of the countless drugs that, from time to time, have been advocated there are but three which, in the present type of puerperal septicæmia, seem to me to possess even an approach to any specific remedial influence—viz., quinine, sulphurous acid, and turpentine. The value of the first-named of these—quinine, more especially when given in combination with grey powder and dried soda—I have already referred to; the second—sulphurous acid—ever since its suggestion by Polli, of Milan, as a remedy in pyæmic cases, has been employed by myself in half drachm doses every third hour in several instances of puerperal septicæmia, in which it has apparently acted as a powerful oxygenating and germicidal agent, and is more especially indicated in those cases wherein the occurrence of gastro-intestinal complication, evinced by retching and diarrhœa, prevents the exhibition of the last of the above-mentioned remedies, to which I shall now refer.

Turpentine.—To this last I would myself attach special importance in all cases of puerperal septicæmia in which its use may be tolerated by the stomach and bowels. In such cases rectified spirit of turpentine, when given in efficient—*i.e.*, 10 to 20 drops—doses every third or fourth hour, and when not specially contra-indicated by the above-mentioned

[a] Vide Arthur and Anderson, in Australasian Medical Gazette. January and March, 1894.

complications, unquestionably exerts a marked influence in relieving meteorism, stimulating the system, and improving the discharges of the puerperal patient, as has been abundantly proved by clinical experience from the time of Dr. Brennan, who, upwards of eighty years ago, was expelled from the Rotunda Hospital for there first insisting on its use, down to that of those who, like myself, have continued its employment in similar instances to the present day.

How turpentine operates in such cases I know not, though, as I have before conjectured, its germicidal potency has probably no less share in its remedial action than its effect as a powerful stimulant. Be this surmise well or ill founded matters comparatively little so long as curative results follow its judicious administration; for if all remedies, the *modus medendi* of which was not accurately known, were to be excluded from the coming edition of the Pharmacopœia, that now bulky volume might well be compressed into Lilliputian dimensions. Two circumstances have probably militated against the more general recognition in modern practice of the value of turpentine in some cases of puerperal septicæmia—viz., firstly, that it is a remedy belonging to a pre-scientific period; and secondly, that it was originally suggested by an Irish physician, and one, moreover, by no means popular with his contemporaries. These objections, although, no doubt, sufficiently grave, are, however, hardly as fully appreciated by myself as they may be by some possibly more scientific practitioners who apparently regard the antiquity of a remedy as synonymous with its inefficacy; or by others again who, in reference to any allusion to neglected Irish medical contributors or contributions, such as Brennan and his suggestion of turpentine, seem disposed to re-echo the old-time expressed doubt, "Can there anything good come out of this Nazareth?" of ours. I am not altogether without hope, however, that the utility in certain forms of septicæmia

of that now too-little employed remedy may perhaps be rediscovered by some foreign authority, and that if thus recommended the value of turpentine in appropriate puerperal cases may be here and elsewhere again more adequately recognised. Besides those three last-mentioned drugs, from which, as I think, some specific advantage may be derived in the treatment of septicæmia, there are, of course, many others available in accordance with the predominant symptoms and stage of the disease, as well as the special condition of the patient in each instance. These remedies, however, it would be needless to consider here, as their employment must obviously be directed by the broad principles of general therapeutics. I may, however, in conclusion, refer very briefly to one agent from which I have experienced much benefit in some cases of this kind—namely, phenazone. In the earlier stages of the diseases no remedy appears to me to have such influence in reducing temperature and pulse-rate, unlocking pent-up lochial and mammary secretions, inducing sleep and tranquillising the patient, as phenazone (or antipyrin) in small—*i.e.*, from seven to ten-grain doses every sixth or eighth hour. The effects thus produced are, however, too frequently but temporary; and in the latter stages of puerperal septicæmia, or where from the first the intensity of the septic intoxication and consequent prostration are most marked, then, it is almost needless to add, antipyrin is distinctly contra-indicated.

Dr. E. Hastings Tweedy said he was glad to hear Dr. Madden giving the preference to aseptic instead of antiseptic treatment. Students were apt to imagine that merely dipping their hands in a solution of corrosive sublimate rendered the conduction of labour, as far as infecting the woman was concerned, devoid of danger. They did not realise, as a rule, that they must have their instruments laid on aseptic material, and that the basins they used must be

rendered aseptic. He also said that the experience of large maternities was against the view that septicæmic infection was conveyed by the air.

Dr. A. Smith pointed out the great difficulty met with in private practice, especially in England, in getting a nurse who understood and practised the aseptic or antiseptic management of a case and of obtaining aseptic surroundings.

Dr. Doyle drew attention to the necessity of men engaged in midwifery practice refraining from, at the same time, attending infectious cases.

Dr. Smyly emphasised the advantage of aseptic treatment over the antiseptic treatment. He said that Professor Leopold was one of the first to insist on the danger of vaginal examinations, even when made with antiseptic precautions, and of the antiseptic vaginal douche as a prophylactic measure. He thought that prophylactic douchings should be avoided. He had read in the *Lancet*, some three weeks ago, a leading article stating that all that was at present known of value in the management of childbirth, as regards the avoidance of septicæmia, could be found in any book of ten years ago. He did not agree with this, but considered the adoption of the aseptic in preference to the antiseptic treatment to be one of the greatest advancements in obstetrics.

Dr. More Madden briefly replied.

SECTION OF PATHOLOGY.

MICRO-CHEMICAL REACTION OF CELLS IN THEIR RELATION TO IMMUNITY.

By J. ALFRED SCOTT, M.A., M.D. Univ. Dubl., F.R.C.S.;
President of the Pathological Section;
Professor of Physiology in the Royal College of Surgeons in Ireland.

[Read in the Section of Pathology, November 3, 1893.]

The study of pathological processes has always been of great interest to me, not only from their practical importance, but also from their intimate connection with normal physiological ones. Both are necessarily the same vital phenomena. In the one case we have the normal functions of the body, and in the other the same functions going a little too fast, or too slow, or irregularly, through some outside agency.

One of the most helpful studies in connection with the understanding of some difficult phases which occur in health are explained by the changes which can occur if the healthy condition be upset; while conversely the study of pathology is difficult without a knowledge of the proper uses of the affected parts.

Very much more attention is now given to the behaviour of individual cells. Many functions which were supposed to belong to the body at large are now known to belong to particular cells, and probably, as our knowledge extends into the way in which protoplasm can be differentiated, we shall be able to localise these functions still better, and then see how these parts are modified by disease.

It is now well known that protoplasm is not a simple substance, but that it consists of at least two parts—a fibrillar substance, and a more liquid substance between the fibrils—the spongioplasm and hyaloplasm; while in the cell nucleus we have at least three parts—coarse fibrils which stain easily, and hence termed, though unfortunately, chromatin; fine fibrils, which stain with difficulty, the achromatin; and a fluid between the fibrils probably similar to the fluid in the cell protoplasm.

In some cells we have another point of interest. To quote from Hertwig—"At the tips of the spindle" (which appears during the division of the cells) "there may be demonstrated two special and exceedingly minute bodies, one of which occupies the exact centre of each of the systems of rays. They are, in fact, to be regarded as the cause of the latter, and inasmuch as during the elongation of the nucleus they are to be found at each of its two poles, they may be especially designated as *polar corpuscles*, or *centrosomes*, or *attraction spheres*. During the whole process of division of the nucleus and cell-body it appears as a directing force belonging to the two polar corpuscles."

The functions of the chromatin filaments in the nucleus seem to be most intimately connected with the reproduction of the cell. If an amœba be divided both halves may grow to the full size, but only that which contains the nucleus can further divide itself. Again, in nearly all cells, animal and vegetable, where the process of division has been satisfactorily watched, the division has been seen to commence in the chromatin fibres. And in the ovum of such animals as possess ova sufficiently transparent, portions of the chromatin of the nucleus are cast off, these being termed the *polar bodies*—these are quite different bodies from those just described as polar corpuscles or attraction spheres—the small portion of chromatin which remains is that

alone which can be considered the nucleus of the female cell, or rather the female *pronucleus*. This small portion is reinforced by the *male pronucleus*, which, according to Van Beneden, has divided in a somewhat similar manner. The union of the selected portions of the chromatin of both pronuclei forms the true nucleus of the germinal cell, which is then constituted with powers of rapid reproduction not possessed by other cells normally existing in the body.

The addition of various chemical solutions to the cells under the microscope has long been recognised as a means of facilitating research. Formerly the addition of acetic acid was described as one of the methods of recognising pus cells, which it made more evident by clearing up the cell protoplasm, while the nucleus became more apparent. There is evidently something in the nucleus which is insoluble in dilute acids. Again, most of the microscopic sections we see now are stained in many cases simply to render the nuclei visible as a guide to the position of the cells. But these colours are really chemical re-agents, the full import of which I cannot now enter upon. A couple of examples will suffice.

The name chromatin has been given, as I have mentioned, to a part of the nucleus from its great affinity for dyes, but the protoplasm also takes up some. Indeed every tissue in the body can be coloured if we use an appropriate colouring material. The aniline dyes have given us most light on their action. It has been found that these dyes differ amongst themselves, some having reactions like chemical acids, and some like bases. They have been named accordingly, and we speak of acid and basic dyes. These groups, although of different colours, stain their own class of substances. Thus modified protoplasm as found in red blood corpuscles, and commonly the cell protoplasm, stain with acid dyes—the former more strongly—while the nucleus

stains most strongly with basic dyes, the chromatin being most intensely stained.

By means of these reactions Ehrlich has described four or five varieties of leucocytes, which have all probably different origins and functions. To these, however, I shall have to return.

The more ordinary methods of chemistry have been applied in the investigation of the position of the element iron in the cells. This substance being darkened, even when in chemical combination with proteids, by sulphide of ammonium, or ferrocyanide of potassium and hydrochloric acid; in these tests, it was found that the iron is principally located in the nuclei, probably in chemical combination with an albuminoid called nuclein, to be mentioned more at length later on. But the method which has tended more than any other to throw light on the composition of the tissues is the method worked out by Lilienfeld and Monti, and published last year. It consists of a modification of the molybdate of ammonium reaction with phosphates, a yellow precipitate of phosphomolybdate of ammonia being formed.

Their method consists in soaking the tissues in a solution of molybdate of ammonia for a greater or less length of time, depending on the firmness of the combination of the phosphorus in the tissues, then washing away the free solution, and reducing the precipitate with a solution of pyrogallol. This gives a brown colour where the phosphorus was—the intensity of the coloration depending on the amount of that element in combination.

Briefly, they found that muscle stains diffusely brown; kidney also diffusely from the phosphates in process of excretion; bone also very diffuse and dark from the calcium phosphates in the matrix, but in most other tissues the colour was most intense in the nucleus, slight in the

cell protoplasm, and absent in the connective fibrillar tissue, or in the hyaline substance of cartilage. Where it was possible to distinguish the chromatin fibres in the nucleus, as in dividing cells, they were very deeply coloured.

This method has been since used to determine the nature of the colloid substance in the thyroid body—of recent interest in connection with myxœdema—and it was easily shown to be an albuminoid, phosphorus-holding body, and not mucin, which did not contain any phosphorus.

If we examine the nuclei in bulk we can extract from them by chemical means materials which possess the above reactions. Such quantities of nuclei can be obtained from yeast, or pus; the protoplasm being removed by repeated artificial gastric digestion, only the nuclei are left. This extract has long been known as nuclein. It appears to belong to a class of substances composed of a combination of an albuminous body with nucleic acid—some members of the class containing mostly nucleic acid, and some very little.

Nucleic acid contains about 10 per cent. of phosphorus, and has a strong affinity for basic aniline dyes, hence the strong colour obtained either by molybdate of ammonia or the ordinary histological stains.

Apparently nuclein can combine with a further variable quantity of proteid forming the group known as nucleo-albumins. These can be obtained from almost any tissue containing cells, either by Wooldridge's method (who called them tissue fibrinogens), by soaking the minced tissue in water, and precipitating the nucleo-albumin by acetic acid, and redissolving precipitate in dilute sodium carbonate, or by Halliburton's method—that of grinding the tissue with sodium chloride, and throwing it into a large quantity of water, and collecting and dissolving in dilute sodium carbonate the sticky substance which floats.

These substances exist in fluids of the body as well as in

cells, such as the fluid of pus, synovial fluid, and the viscid material of bile. So that probably not only are they a proper part of the cell composition, but cells have the power of forming them as a sort of secretion. These nucleo-albumins are of great practical interest—

1. From the peculiar power possessed by some of causing rapid coagulation of blood.

2. Therapeutically, as in all probability the basis of the thyroid and other tissue extracts recommended in the treatment of various diseases.

3. Their similarity to bodies used to protect animals from infective disease termed alexins (Hankin).

To this last clause I would direct your attention more particularly. All protoplasm possesses in its original form certain powers of self-defence. Differentiation sometimes reduces this power, but such cells are guarded by others in our complex bodies, which allow these cells to work with less outside interference. Other cells with us have this power of defence exaggerated, probably through their continued contact with parasites, some of which are animal, and some vegetable. It is obvious that a single cell can have no power against an animal many times larger than itself. Hence those against which cellular activity are exercised are the unicellular organisms which are in most cases smaller than the cells of the body, and can enter and live in them.

Ruffer doubts if the higher animals can ever completely get rid of microscopical animal parasites, and cites the Coccidium oviforme of the rabbit, which is encapsuled but not removed—the Hæmatophyllum malariæ of ague which is notable for its recurrence throughout life, even after the sufferer has left the malarial district, and the protozoa which he believes to be the cause of cancer. But in diseases caused by vegetable parasites—as abscess, erysipelas, tubercle, &c.—the body is often able to kill the parasite,

although the deformity caused during its residence may remain. With some, however, it is not so—the parasites are too strong, the cells are poisoned, and the animal dies.

In a few of these cases, and their number is increasing slowly, if the cells get a little outside help they are able to resist the disease. This has most generally been done by small doses of the fluid in which the parasite was cultivated artificially, or small quantities of the micro-organism which had been weakened by physical or chemical means, or by its passage through another animal, being injected into the body. The cells are thus able to acquire a tolerance, and resist the inroads of the more virulent forms of that disease subsequently. To account for these things two great doctrines have been proposed—(1) that the blood-cells eat up the micro-organisms; and (2) that the fluids of the body are able to kill the micro-organisms when they get in contact with them.

With regard to the first of these methods, we know that the white blood corpuscles can be fed with various substances, and that their method of feeding is precisely similar to that of certain protozoa. Metschnikoff observed that these protozoa are able to devour micro-organisms, and by careful watching could see these micro-organisms undergoing various degenerative changes in the body of the protozoon, undoubtedly a process of digestion. That these constituted the food of the protozoa was evident to me long since. I have been in the habit of keeping certain fluids in vessels—small aquaria, in fact—in order to have these forms of life in connection with the summer histological class. I have noticed that the inhabitants of a vessel often changed. If the fluid appeared foul it contained bacteria, but after a time it became clear and very few bacteria were present, but many protozoa; these subsequently giving place to others—either from being devoured by higher animals, or

dying from want of food—a repetition on a small scale of the great increase of owls which appeared during the plague of field voles in Scotland.

The white blood corpuscles, leading a free and independent life in the blood, and possessing all the animal functions well marked except reproduction, take into their interior any substance of the nature of food—such as small granules, dead or living micro-organisms. Some cells very similar in appearance to the others are able to devour large quantities of material, as normally takes place in the removal of the tail of the tadpole when it leaves the water, or abnormally in the removal of a catgut ligature.

The leucocytes which might have these functions have been examined by Ehrlich and Metschnikoff. As viewed in the fresh state it is difficult to distinguish them but they have different reactions to the aniline dyes as to their nuclei and certain granules which exist in the cell protoplasm, and thus we have four varieties of greater or less importance—

1. Small lymphocytes, with round nucleus and little protoplasm.

2. Large lymphocytes derived from the former.

3. Eosinophilous leucocytes with lobed nucleus, and with granules in the protoplasm, which stain intensely with acid dyes as eosin or rubin.

4. Polynuclear leucocytes, with deeply-lobed nuclei, or the lobes may be separated, and generally possessed of an attraction sphere. The nucleus stains with basic dyes, the granules with neutral dyes, the protoplasm remaining unstained.

The small lymphocytes are too young to have any powers of englobing foreign bodies. The eosinophilous cells, according to Metschnikoff, cannot, although this has been doubted by Hardy and Kanthack. But those which possess this power in the highest degree are the large mono-nuclear and

poly-nuclear neutrophile cells. These cells have the power of taking up living bacilli. Single leucocytes containing bacilli have been picked out and placed in bouillon under the microscope, and the bacilli were seen to grow; but if the cells were allowed to remain in the blood the bacilli could be observed in various stages of digestion and destruction.

Under certain circumstances large quantities of cells gather to the neighbourhood of micro-organisms, as in an abscess. Generally the front ranks die, but reinforcements arrive and remain until the micrococci are either dead or removed. This process of attraction is termed chemiotaxis. Certain substances are formed by micro-organisms, it appears most likely by the decomposition of some dead ones. These substances attract the leucocytes, and being attracted they find and destroy other micro-organisms.

I may mention two examples of this amongst fungi. If a fragment of a green filamentous alga be placed in water with Bacillus subtilis, or other strongly aerobic micro-organisms, and the plant be illuminated with a small substage spectroscope, the bacilli will congregate in the yellow, not that they can appreciate that colour, but, as Sachs has shown in his "Physiology of Plants," oxygen is given off most freely by plants in this coloured light, and as these bacilli can move, and must have oxygen, they naturally move to where it is most abundant.

The behaviour of a myxomycetous fungus is much more instructive. The early forms of these fungi after the germination of the spore is similar to the amœba. After a time these amœboid swarm-cells join together by their edges, and join to others, until there is a single large mass of protoplasm with many nuclei termed a plasmodium, which grows in size, but retains for a long time its power of movement as a whole, so that it is like an enormous amœba in the form of a copiously branched reticulated or frill-like

expansion, covering a surface varying from one inch to a foot, and in which the movement may sometimes be seen with the naked eye.

In De Bary's Comparative Morphology and Biology of the Fungi, Mycetozoa, and Bacteria (p. 450), we find a description of the behaviour of one, the Fuligo varians (Rostafinski), otherwise Æthalium septicum, a myxomycete usually found on old tan:—

"Vegetating plasmodia spread out on surfaces, which yield little or no nutriment, move towards bodies which contain nutrient substances as soon as they are offered to them—here, too, without regard to the direction in space in which the movement has to be made. If the plasmodium of Fuligo which usually lives in tan is spread out on the moist vertical wall of a glass, it remains in this position, other things being the same, as long as the surface of the glass is covered with a film of pure water. If an infusion of tan is added to the water, in such a way that the plasmodium is touched by it at one point only, it begins to move rapidly towards this spot, and gradually puts out numerous branches which dip into the infusion. A small piece of tan placed close to the plasmodium under similar conditions is quickly seized by a number of freshly protruded branches. The similarity in the effect of the fluid containing the infusion of tan and the solid piece of tan shows that it can only be due to the chemical constituents of the tan; what these are has not been precisely ascertained.

"If a plasmodium comes into contact on one side with other bodies dissolved in water, the opposite effect is produced—namely, repulsion of the plasmodia. Even a solution containing half or quarter per cent. of grape sugar produced this effect at first on Stahl's experiments, but the plasmodium by degrees became accustomed to it, and behaved to it as to the infusion of tan. A sudden change in the concentration of the saccharine solution, either by increasing it to a certain amount (two per cent.) or diminishing it, gives rise to similar phenomena to those first described. Stahl observed the same repulsions in experiments with saline solutions.

"If oxygen is excluded on one side, a movement takes place, as

might have been expected beforehand, towards the side where oxygen is admitted."

This effect of certain substances on the protoplasm of Fuligo gives the key to the explanation of immunity from the phagocytic point of view. Leucocytes, which would ordinarily succumb to a certain poison, become acclimatised to it if it be administered in sufficiently small doses, and thus are able to carry out their function even in a poisonous environment.

Apart from the active interference of the living cells the fitness or unfitness of the soil on which the micro-organisms grow is of the first importance. We know the blood of some animals resists bacteria to a remarkable degree, while some succumb to nearly every disease, and experiments have shown that even the fluids derived from the blood of some animals and freed from leucocytes, have a profound effect on some bacilli. Thus, Bacilli anthracis if placed in collodion tubes, and inserted under the skin of frogs, are killed, the leucocytes being unable to pass through the collodion film while the lymph can. In this case the frog is naturally immune to anthrax, and can only be infected by keeping the animal under unnatural conditions. Amongst animals naturally susceptible to disease we find that if rabbits and guinea pigs be rendered immune by injection, and the blood removed and allowed to clot, the serum has the power of either killing or attenuating virulent bacilli, which may be grown in it. The micro-organisms found in anthrax, erysipelas, tetanus, and pneumonia, are amongst those affected thus.

Again, the toxin produced by the tetanus bacilli can be isolated, and is found to lose its poisonous qualities if it be mixed with the serum of an immunised animal, or if the serum from an immunised animal be injected into a susceptible animal it immediately confers immunity. An

important case bearing on this is quoted in the *British Medical Journal* from the *Riforma Medicale*. Lesi describes a case of tetanus brought on by a wound from a piece of glass while walking over a heap of stable refuse. Symptoms appeared on the sixth day, and on the eighth day treatment was commenced by the administration of four doses—*i.e.*, 50cc., 20cc., 10cc., 20cc.—of serum from one of Tizzoni's immunised horses. After this the patient rapidly became better, and was able to leave his bed six days from the date of admission.

In these cases something must be in immunised blood which is not in ordinary blood. Buchner, who leads the humoral side of argument in immunity, holds that it must be some chemical change, and here we find the importance of the nucleo-albumins alluded to a short while back.

Wooldridge, when working with his "tissue-fibrinogens," extracted from the thymus or testis, found that in some cases injections rendered the animal immune to anthrax.

Wright repeated these experiments, and states that he had never made a series of experiments without obtaining either a prolongation of life or complete cure by means of "tissue-fibrinogen" injections, but noticed that, at the same time, a very extreme degree of leucocytosis was brought about. Later by injection of nuclein alone he succeeded in both prolonging life and producing the condition of leucocytosis.

Vaughan, Novy, and M'Clintock have shown that nuclein obtained from testes or yeast was able to kill Staphylococcus pyogenes aureus or Bacillus anthracis in from five minutes to one hour, the time being largely dependent on the amount of dilution.

The tissue fibrinogens used by Wright are very powerful chemical re-agents; but somewhat different in their action, as slight difference in the method of preparation may, for

example, prevent the clotting of blood, or make it clot with extreme rapidity, and there are several substances produced by bacteria on which they may act. Thus, the investigation on bacterial products have shown the following poisons:—

1. Those produced during life by the metabolism of the bacteria—(*a*) Toxins, bodies of an alkaloidal nature; (*b*) Ferments similar to the proteids in their re-action.

2. Bodies of an alkaloidal nature produced from the substances in which they live.

3. Bodies of the nature of albumoses produced by the death and decomposition of the bacteria. These last possess the highest chemiotactic power.

With some of these poisons the nucleo-albumins may unite and thus neutralise them, or they may have an antagonistic effect as obtains amongst some other vegetable alkaloids.

We have thus two sides to the argument—first, that the leucocytes eat up the bacilli alive; and, secondly, that the bacilli are killed and the phagocytes devour them like any other dead material which it may be necessary to remove from the body. But perhaps both sides are right. We may have two separate actions, local and diffuse—local where the cells are able to destroy the bacilli at the place of entry, diffuse where the bacilli get beyond the point of entry and are killed or weakened by the fluids, or when the poisons formed by the bacilli are neutralised or weakened, either condition of weakening acting as an acclimatising agent on the leucocytes, which thus get the victory over the living organisms, while the poisons are excreted by the ordinary channels. The fluid most directly concerned in these actions is the blood. This we must look on, not as simply a body fluid, but as a tissue. Certainly it is a fluid, and acts as a fluid in carrying soluble substances to various parts of the body, thus undergoing a constant change. But along with

this variable moiety it has a wonderfully constant moiety, and this must be maintained by cells in some part of the body; it is probable that the leucocytes do a great deal. Hunter has found that the removal of the spleen renders the animal more susceptible to certain chemical poisons. Bardach has shown the same for bacterial poisons, and whatever function the spleen possesses it appears to be largely connected with maintaining the balance of the blood composition.

Is it not possible then that the bacteria which first find entrance to the body succumb, by their death they give off albumoses which attract more leucocytes, some of these leucocytes may either succumb, and by their decomposition give off nucleins which assist in the destruction of the bacteria; or the albumose which attracted the leucocytes may at the same time cause them to secrete some neutralising albuminoid?

We have seen that by small doses of bacterial poisons these leucocytes may become so acclimatised that they are able to endure, in some cases, for the remainder of the animal's life. May they not as easily be caused to secrete some form of nucleo-albumin, possibly to a greater extent than normally takes place, and thus be able to protect the body against any future attack of the disease? In that way the cells act on the bacteria, either directly or by the blood fluids, the composition of which is in their own control.

LARGE COAGULUM ADHERENT TO THE MITRAL VALVE IN A CASE OF ACUTE RHEUMATISM FATAL THROUGH HYPERPYREXIA.

By JOHN W. MOORE, M.D., Univ. Dubl., F.R.C.P.;
Physician to the Meath Hospital.

[Read in the Section of Pathology, November 3, 1893.]

On Monday, October 9, 1893, Thomas S., aged twenty, a recruit in the Dublin Metropolitan Police, was admitted from Kevin-street Barracks to the Meath Hospital under my care. When admitted, he complained of constant pains in both knees and in the ankle-joints, which were swollen and tender on pressure. The pains were much increased on moving the limbs. The right shoulder was also affected, and, in addition, he complained of sore throat as well as of a feeling of tightness over the precordial region.

Mr. Francis W. Goodbody, clinical clerk, and Mr. E. A. Bourke, the case-taker in charge, to whom I am indebted for very full notes, ascertained that the patient had been ailing for at least a week before admission, the chief symptoms being nausea and vomiting of food. On the Saturday evening previous to his admission (October 7) he had a shivering fit, which he attributed to a chill caught while at drill on the morning of the day named. Next day (Sunday) he was obliged to stay in bed, and suffered from severe shooting pains in his back.

His past medical history was that as a child he had an

attack of scarlatina, and in May and June, 1891, he was laid up with an attack of rheumatism, which affected chiefly his knees and ankles.

On the evening of his admission his pulse was 86, the respirations were 26, and the temperature was 102·8°.

On examination next morning a well-marked systolic murmur was heard over the mitral area. There is no note as to the presence or otherwise of a presystolic murmur, but there was no valvular thrill, nor could any evidence of pericarditis be detected. The tongue was thickly coated. The urine was concentrated, dark-coloured and turbid from urates. There was unusually profuse sweating, the sweat having an intensely sour smell and an equally striking acid reaction. The patient seemed to be very uneasy and anxious about himself.

The affected joints were wrapped up in absorbent cotton wool, he was clad in flannel, a small blister was applied over the region of the heart, and he was put on medium doses of salicylate of sodium.

The temperature fell steadily to 99·6° on the morning of Thursday, October 12, and to 98·6° on the morning of the 13th; but, notwithstanding, the patient was evidently not doing well. He complained of great thirst, and although the pain in the shoulder had disappeared he suffered intensely from pains in his right knee and ankle, and passed a sleepless night.

On the afternoon of Friday, the 6th, the patient's legs and feet became quite numb and cold, so that Mr. Alfred Power, the House Surgeon, stopped the salicylate treatment and gave quinine, digitalis, and opium, in combination in a pill.

Early on Saturday, the 14th, temperature rose to 101·0°, and the heart's action became both quick and violent, while the pulse at the wrist was felt with difficulty. There was profuse sweating, especially about the face and chest. In

the evening the temperature was 103°, and the patient was losing consciousness.

On Sunday morning, the 15th, everything had changed for the worse. The thermometer stood at 104°. The tachycardia was more pronounced, and dyspnœa had set in, assuming to some extent the character of Cheyne-Stokes' respiration. The feet and legs were quite cold, but the trunk was burning hot.

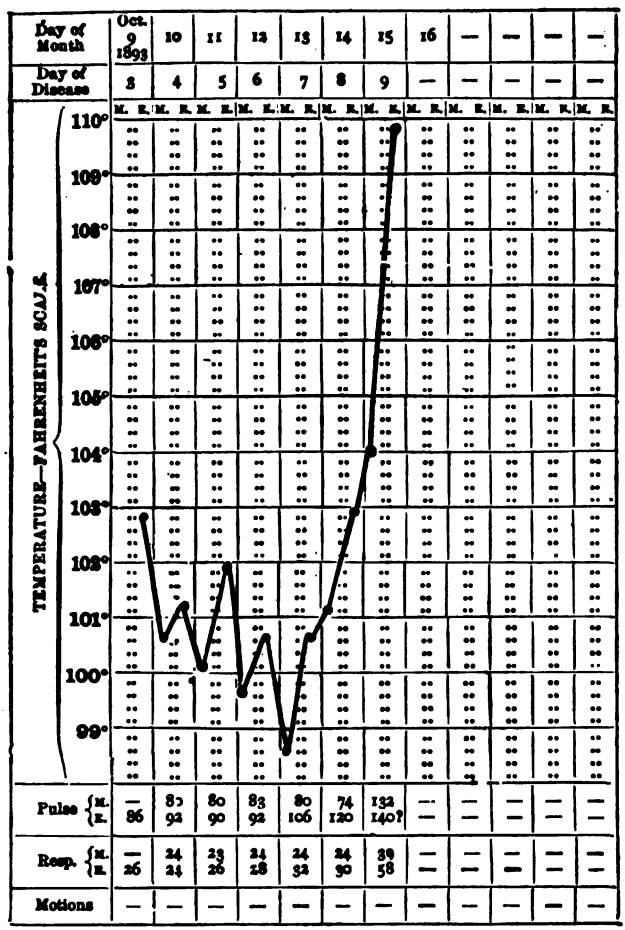
As it seemed risky to put him into a cold bath, or to apply the ordinary wet pack, he was wrapped in wet towels. At 3 45 p.m. the temperature read 106·6°. It was afterwards taken hourly until death occurred shortly after 11 30 p.m., with the following result:—

6 p.m.—107·0°.
7 „ —108·0°.
8 „ —108·2°.
9 „ —108·2°.
10 „ —108·4°.
11 „ —108·6°.
12 midnight.—110·0°, nearly half an hour after death.

A *post-mortem* examination was made on the morning of Monday, October 16, by Mr. E. E. Lennon. The lungs were healthy. The liver was slightly full, and rather soft. There was no trace of pericarditis, or of recent endocarditis. The heart was hypertrophied, but distinctly softened. A little atheromatous change was observed at the usual situation a few lines above the aortic valves. These were themselves quite healthy. A large clot closely adhered to the mitral valve, blocking up its lumen to a very considerable and serious extent. This large clot was apparently of old standing. It probably dated back to the previous attack of acute rheumatism in the spring of 1891. At all events it is hardly possible that it could have developed during the patient's fatal illness.

Clinical Chart of Temperature, &c.

T. S.; Age, 20; Disease, *Acute Rheumatism;* Result, *Death.*



Professor J. A. Scott was good enough to examine the specimen at my request and I have received the following note from him:—

"I find that the vegetations on the mitral valve in your case consist of a blood clot. I was unable to make an extended examination on account of the specimen not being properly hardened, and as I did not care to damage the appearance of the specimen by cutting away a portion when it could be done most usefully.

"If it is thought well, this can be done subsequently."

Dr. Scott suggests that the sequence of pathological phenomena was—an attack of rheumatic endocarditis, involving the margin of the mitral valve, an escape and consequent perishing of leucocytes, which excited fermentation, and caused coagulation of the blood, thus leading to the formation of this great clot, which resembles a vast valvular excrescence, outgrowth, or vegetation.

Dr. Frazer inquired if there was any possible history of gonorrhœa in the case.

Dr. Moore informed him that no such history was forthcoming.

TWO CASES OF HYDROCEPHALUS, ASSOCIATED WITH COMPLETE ABSENCE OF COMMUNICATION BETWEEN THE FOURTH VENTRICLE AND THE SUBARACHNOID SPACE.

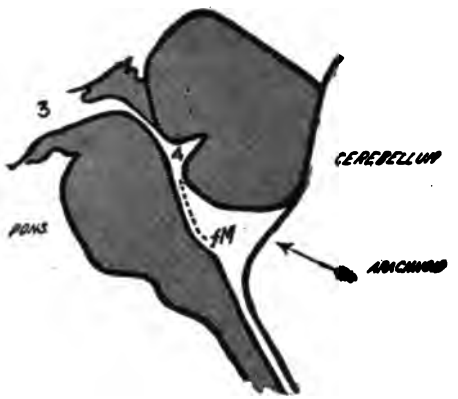
By JOSEPH O'CARROLL, M.D., F.R.C.P.;

Physician to the Richmond, Whitworth, and Hardwicke Hospitals, and to the Children's Hospital, Dublin.

[Read in the Section of Pathology, December 1, 1893.]

BEFORE entering on the description of the brains which I show to the Section, it may be well to recall the fact that, under ordinary circumstances, the arachnoid membrane is separated from the pia mater opposite all the considerable depressions in the brain-cortex, by a space called the subarachnoid space; further, that this space is in communication with the cerebral ventricles at certain points at which the cerebro-spinal fluid can flow outwards into the space, or possibly in the reverse direction, should the pressure bear that way. Now the largest gap between the arachnoid and pia mater is at the interval between the cerebellum and the medulla—the so-called *cisterna cerebello-medullaris*—and this space is continuous below with the great subarachnoid cavity around the spinal cord, while above it communicates by foramina in the curtain of pia mater covering the lower part of the roof of the fourth ventricle, with that ventricle, and, consequently, with the general ventricular cavity of the brain. These foramina are the central one of Magendie and the two lateral ones described by Mierzejewski.

The diagram *A* will illustrate the normal condition, while *B* is a tracing from the first case about to be recorded.



A. Diagram from Quain's "Anatomy," showing the fourth ventricle (4 and its boundaries in median section. The arrow points to the arachnoid; the dotted line represents the pia mater, perforated at *f M* by the foramen of Magendie, which forms a communication between the fourth ventricle and the cisterna cerebello-medullaris, the triangular space in which the letters *f M* are.

B. Median section of fourth ventricle from Case I.—natural size—showing the same parts as diagram *A*, except that the ventricle is much dilated and the cisterna absent, the pia and arachnoid being fused into the thick imperforate membrane, to which the arrow points.

If we assume, with regard to the cerebro-spinal fluid, that the main physiological condition is one of ventricular secretion and arachnoid resorption or excretion, we shall have then, on the whole, a tide outwards through these foramina, and we must suppose that occlusion of the communications of the ventricles with the subarachnoid space must tend to produce a condition of retention of fluid within the ventricles, and a consequent dilatation of them. This dilatation will be considerable in proportion as the parts are yielding, as in infancy and childhood, or as the other modes of communication between the ventricles and the subarachnoid space are less developed or less capable of compensatory activity.

I shall now describe two cases in which the pia-arachnoid cavity between the cerebellum and the medulla oblongata was obliterated, and the posterior openings of the ventricular cavity were absent :—

Case I.—A boy, aged thirteen years and six months, of healthy family. Head normal at birth; at nine months "he slept for two days and two nights continuously, and was constantly crying for six weeks afterwards." The head began to grow large at that time, and increased in size for about six years. For the past two years he has had frequent headaches and retching, especially in the morning before eating. Has never walked, but crept about on all-fours.

When admitted to hospital for the headache and retching, the following conditions were noted—Circumference of head, 66 cm. 26 inches); legs completely flexible, but only extensible to about 150 or 160 degrees; hands and feet chubby and small; right leg better developed than left, and right knee has a great thick soft pad over it, covered with thickened skin. The dorsum of each foot and the palms of the hands have coarse callosities on them. These conditions are plainly due to the creeping posture, which has been habitual with him. The reflexes, generally, are rather sharpened. Sensation is normal. Is able to sit up in bed; talks intelligently, but has no education. Lies frequently on his face, and complains often of headache. Eight days after admission—

at 6 a.m. he vomited; at 7 30 he sang a song, sitting up in bed; at 8 a.m. he fell back suddenly and died.

At the *post-mortem* examination no cause was found for the suddenness of death. The head seemed unduly movable on the trunk, but no sign of fracture, dislocation, or compression of the spinal cord could be found. The skull and brain were unsymmetrical, the left side being much longer than the right. The skull bones were thin and translucent, with little or no cancellous tissue. The brain was distended in the manner common in these cases—that is to say, the lateral and third ventricles formed one large cavity, hardly showing a trace even of the median division caused by the longitudinal fissure. The corpus callosum hardly existed in the middle line, except, perhaps, as a very thin lining to the pia mater in front and behind. The Sylvian aqueduct was almost cylindrical, about 2 mm. in diameter. The fourth ventricle, which suffers much less in cases of hydrocephalus than do the other ventricles—probably on account of the resistance of the cerebellum, the medulla, and the bony posterior fossa and the tentorium—was enlarged to about the size of a large almond, while a prolongation of it extended into the cerebellum to a distance of 3·5 cm. The ventricle was perfectly closed behind by a membrane binding the cerebellum down to the medulla oblongata, this membrane being quite unlike the layer of arachnoid ordinarily present in this situation, inasmuch as it was formed by a fusion of the pia with the arachnoid into a rigid imperforate curtain between 3 and 4 mm. thick, and about 2 mm. in vertical length. There was here no cisterna cerebello-medullaris and no foramen of Magendie, and the membrane was so thick as to oppose filtration outwards from the ventricles, unless under much increased pressure.

Case II.—A girl, aged four years, had had an abnormally large head from infancy, but her birth had been normal, and the abnormal growth of the head was not noticed till she was about nine months old.

On admission, head measured in fronto-occipital plane 60 cm., or 23½ inches. She died at the close of an attack of measles, by the supervention of bullæ on the legs and feet, rapidly forming bed-sores, and broncho-pneumonia.

Post mortem.—The brain presented a condition of excavation almost exactly like that found in Case I. As in that case the

cerebellum was bound down to the medulla, but here by a close dense adhesion, and not a measurable membrane. There were no apertures of communication whatsoever between the fourth ventricle and the outside, and no remnant of a subarachnoid space between the medulla and the cerebellum. In addition, the temporo-sphenoidal lobe was bound apparently by old adhesive inflammation to the neighbouring parts of the brain, a condition which may hint at the origin of the cerebello-medullary adhesion in a meningitis of uterine or infantile life.

In these two cases, then, hydrocephalus was associated with closure of the normal apertures of communication between the fourth ventricle and the subarachnoid space; in both, probably, as the result of an original adhesive lepto-meningitis. It is to illustrate this condition, as a cause of hydrocephalus, that I have brought forward these specimens. The other causes offered for hydrocephalus group themselves practically into (*a*) an inflammation of the lining layer of the ventricles and of the choroidal plexuses within them, resulting in effusion or excessive secretion; and (*b*) pressure upon the efferent veins from the ventricles as by any form of tumour—a condition mainly described as occurring in relation to the veins of Galen and the straight sinus. The condition present in my cases is in nowise inconsistent with the conditions under (*a*); it may well be that an ependymitis and choroiditis interna were in one or both of these cases conjoined originally with the meningeal affection, which resulted in occlusion of the fourth ventricle, but of this internal inflammation no marked signs persisted.

DILATATION OF THE STOMACH, WITH REMARKS ON ENTEROPTOSIS (GLÉNARD'S DISEASE).

By H. C. TWEEDY, M.D. Dubl., F.R.C.P.;
Physician to Madam Steevens' Hospital, Dublin;
Examiner in Medicine, Conjoint Board, R.C.P. and R.C.S.

[Read in the Section of Pathology, December 1, 1893.]

The case I have the honour of submitting to the Pathological Section is interesting from a twofold aspect. In the first place it is not very frequently that we have an opportunity of making a *post-mortem* examination on a case of dilatation of the stomach so well marked as in the specimen before you, and in the second place it gives me an opportunity of describing a remarkable anatomico-pathological condition first described by Glénard[a] in 1885, under the name of Enteroptosis. This has been subsequently discussed in a very exhaustive manner by Ewald,[b] of Berlin, Einhorn,[c] of New York, and a number of other French and German physicians, but, as far as I am aware, it has not hitherto attracted any notice in this country, though it is of tolerably frequent occurrence, as is evident from the fact that among 1,300 patients with digestive troubles Glénard found 400 with enteroptosis.

Case.—The patient, P. C., in whom these conditions were observed, was a labouring man from the west of Ireland, thirty-five years of age, of medium height, pale and bloodless aspect, attenuated body and limbs, and who had lived for years on a diet consisting largely of potatoes. He was admitted to Steevens'

[a] Lyon Médic. Mars, 1885. T. XLVIII., p. 450.
[b] Berliner. klin. Woch. 1890. No. 12, &c.
[c] Post Graduate. New York. Vol. VIII. No. 2. 1893.

Hospital on the 23rd of October, 1893, complaining of loss of appetite, vomiting, and gastric pains of long standing. He stated that his stomach had been delicate for many years. He had been in the Royal Irish Constabulary ten years before, but had been discharged in consequence of ill health. He subsequently drank very hard, and had an attack of *delirium tremens*. As his stomach trouble continued steadily increasing, he came up to Dublin, and passed under my care. On admission to hospital he presented the appearance already mentioned, being badly nourished, sallow, the surface of the body and the extremities cold, with a subnormal temperature, and constipated bowels. The abdomen was not distended, but was flaccid and easy to palpate. The abdominal organs were apparently normal, no tumour of any kind could be felt, but the stomach was enormously dilated, extending far below the umbilicus, as was evidenced by a tympanitic note, and by the splashing sound which could be freely elicited all over the umbilical and the upper part of the hypogastric region. The stomach contents, which were examined by means of Einhorn's deglutable bucket, showed an almost complete absence of free hydrochloric acid after a test meal, when treated with Günzburg's solution.

After admission to the hospital he had no vomiting for a week. At the end of that time, however, one morning he was much worse than he had been. He said he knew he had caught cold. From that time on he had vomiting every day, and grew weaker and weaker till the night of the 8th of November, when he was seized with fits, of which he had about six attacks, each lasting for about five minutes. He sank gradually, and died of exhaustion on the 9th of November.

The following day a *post-mortem* examination was held. On opening the abdomen almost the entire superficial space was occupied by the stomach, in fact nothing else could be seen at first except a wedge-shaped portion of the left lobe of the liver, which was inserted into a sort of sulcus, which was all that was apparent of the lesser curvature. The greater curvature almost touched the pubes, and covered in both iliac fossæ, and the fundus could be felt as high as the sixth intercostal space on the left side.

On raising the stomach the transverse colon came into view, extending from the hepatic to the splenic flexure in a long curve corresponding roughly to the greater curvature, and about the level of the anterior superior iliac spines. The ascending colon was normal in position and length, as was also the descending colon;

but the angles found at the hepatic and splenic flexures—especially the latter—were very acute in consequence of the descent of the transverse colon. This portion of the intestine and the ascending portion were packed with hardened fæces. The liver, both kidneys, and spleen occupied their normal positions, as did also the upper portion of the duodenum. There was scarcely a trace of great omentum, and the transverse colon, as before mentioned, was almost in immediate apposition with the posterior aspect of the stomach. There were no adhesions, or any other signs of inflammation present. The stomach contained about a quart of liquid, and when after its removal it was filled with water, its capacity was found to be 160 ounces. The pylorus was somewhat thickened, as were also the walls and mucous membrane, except at the fundus, and about the centre of the greater curvature there was a small round cicatrix, about the size of a sixpence, evidently the seat of a former ulcer.

To trace the cause of this great dilatation of the stomach is not a difficult task. First, we have the long and habitual overloading of the stomach. The patient was a poor man. Potatoes had for years formed a staple portion of his diet, and the poor quality of this form of food necessitated taking large amounts of it, thus weighing down the stomach till even the hypertrophied muscles are unequal to the strain of propelling the food into the duodenum. Hence the retention and stagnation of the ingesta, followed by gastric catarrh and subsequent atony and even paresis of the muscular fibres. But there is another—an anatomical—cause; I mean the relation of the pylorus to the duodenum. The first part of the duodenum is two inches in length;[a] it is covered by the same two layers of peritoneum which envelop the stomach; it possesses tolerable freedom of motion, and passes backwards and to the right, turning sharply to form the second portion, which runs downwards for about three inches, and is firmly fixed. Any cause, therefore, that would tend to depress the stomach would naturally cause traction on the pylorus, and consequently on the first portion of the

[a] Vide Manual of Pract. Anat. Cunningham. Vol. I., p. 502.

duodenum.[a] This would necessarily give rise to a stenosis by increasing the sharp bend between the movable first portion and the fixed second portion of the duodenum. This was the more probable as there was little or no constriction of the pylorus, the valve being easily permeable by the tip of the index finger.

But perhaps the most interesting feature of the case was the position of the transverse colon, which represented, though in a somewhat exaggerated degree, the condition described by Glénard under the name of "enteroptosis."

Glénard[b] based his observations on the fact that the alimentary canal, from the stomach to the rectum, is suspended by ligamentous attachments at certain points; that at several of these fixed points sharp angles were formed; and that if any of these ligaments became relaxed or gave way it was attended with two results:—1st. A falling (ptosis) of that portion of the alimentary tract; and 2nd. In certain cases—*e.g.*, in the transverse colon—increased traction on the next fixation point, causing obstruction to the passage of ingesta, and even partial stenosis of the intestine itself. He describes different varieties of this affection, according to the situation in which the attachments become relaxed, as "gastroptosis, hepatoptosis, splanchnoptosis, nephroptosis," &c.; but it is with enteroptosis alone we have now to deal.

Glénard believes that the condition is most likely to arise in the right portion of the transverse colon; that owing to a relaxation of the colico-hepatic ligament, the ascending and transverse portions run obliquely from below upward across the abdomen to the splenic flexure, where the intestine is held firmly in its place by the phrenico-colic ligament; that the acute angle produced at this point by the falling down

[a] Since the above was written, I notice that attention has been drawn to an almost identical condition by Sir Wm. H. Broadbent in his lecture published in the "British Medical Journal," December 2nd, 1893.—H. C. T.

[b] Loc. cit.

of the other end of the transverse colon causes a narrowing of the lumen of the gut and stoppage of its contents. He details several physical signs as diagnostic of this condition, as splashing, pulsation of the abdominal aorta, movable kidney on the right side—all of which may be met with under other conditions; but the physical sign on which he lays most stress is "corde colique transverse," by which he means the sensation on palpation as of a ribbon-like band, one centimetre in width, which was supposed by Glénard to be the displaced transverse colon lying over the aorta, above the navel. His reason for believing this was that pressure in the right iliac fossa on the ascending colon produced rumbling sounds in the "corde transverse."

Ewald is of opinion that the "corde colique transverse" is in reality the pancreas, and believes that the surest method of diagnosticating the condition is to find out the exact position of the stomach. This is done by the ordinary method of inflation or by gastrodiaphany as practised by Einhorn, and if the lesser curvature of the stomach be found below the ensiform process, or midway between it and the umbilicus, he concludes that gastroptosis is present, and, this being so, that the diagnosis of general enteroptosis naturally follows.

In speaking of patients suffering from "Enteroptosis," Glénard alludes to them as nervous dyspeptics, and Ewald classifies the disease among neuroses of the stomach, as the remarkable relaxation of ligaments leading to gastroptosis, splanchnoptosis, &c., would probably most frequently be found in neurotic subjects. But no such cause could be assigned in the present case, in which the condition appeared to be of a purely mechanical origin. In the first place, there was no malposition of the ascending colon, the hepatic flexure was in its normal position, as was also the splenic flexure; but evidently the stomach, as it became more and more dilated, caused strong traction on the freely movable transverse

colon; this it could readily do as the omentum was so short. The intestine was thus gradually drawn down and stretched till it was much greater than its normal length, extending, as it did, along the posterior aspect of the stomach, level with, and in the mesian line lower than, the two iliac spines, while the accumulation of fæces further increased the weight of the bowel, and also in a great measure accounted for the constant pain the patient suffered, as there was a continual drag on the phrenico-colic ligament.[a]

This case, then, though exhibiting a true ptosis of the transverse colon, differs from the *disease* Enteroptosis, as described by Glénard, in the following particulars:—

1st. The patient could not be pronounced in any sense a neurotic subject.

2nd. The hepatic flexure of the colon was in its natural position, nor was there relaxation of any of the attachments of the bowel with the exception of the transverse meso-colon.

3rd. In a typical case of Glénard's disease the transverse colon is the first part affected; then follows relaxation of the mesentery, the small intestine descends to the pelvis, the stomach is then drawn down (gastroptosis), and subsequently there may be a falling of all the viscera, constituting what he termed splanchnoptosis.

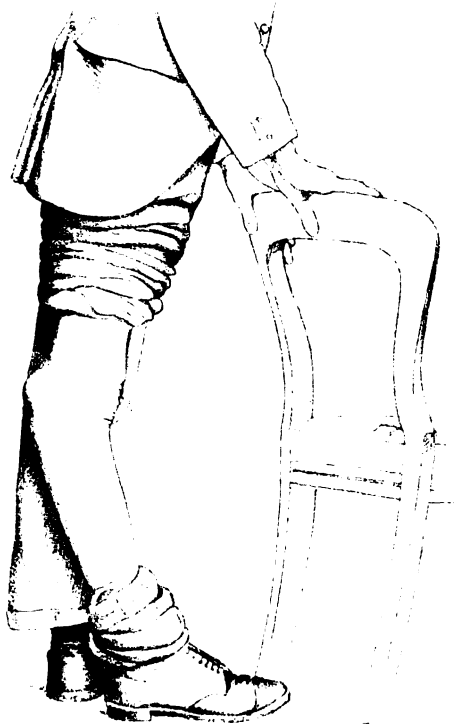
In the case before us, however, the ptosis of the transverse colon was distinctly secondary to the dilatation of the stomach, or at least coincident with it.

Dr. Scott called attention to the fact, which this case illustrated, that it was not in cancer of the stomach only that hydrochloric acid was absent from the gastric secretion. This man seems to have lived, as it were, on potatoes, and as the stomach does not digest

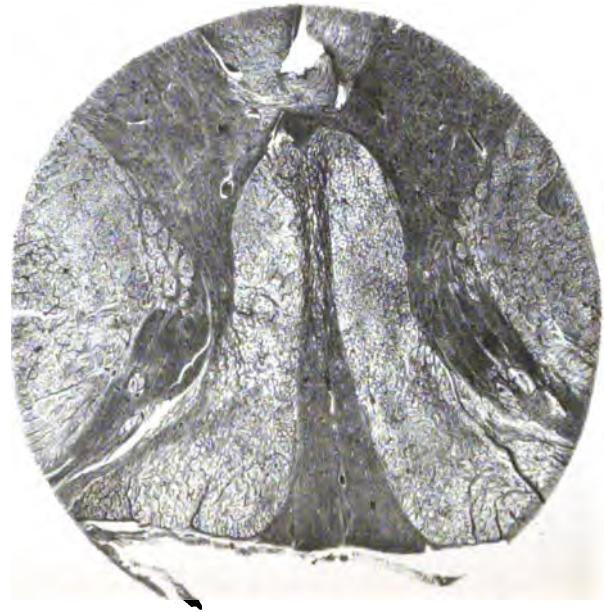
[a] Vide Paper on "Causation of Left-side Pain." By Dr. Wallace Beatty. Trans. Royal Acad. Med., Ireland. 1883. P. 25.

potatoes, the gastric juice would be of no use and so would cease to be secreted.

Dr. Finny thought that the dilatation might be due to muscular debility or congenital malformation. The mere mechanical cause seemed to be an insufficient one. The close connection of the transverse colon with the stomach might have something to say to it, as this is sometimes very long, and would, when full, exercise considerable traction.



From Phot



DR NUGENT ON CHARCOT'S DISEASE.

T. Huth, Lith^r Edin^r

CASE OF LOCOMOTOR ATAXY, WITH SPECIMEN OF CHARCOT'S DISEASE.

By G. P. L. NUGENT, M.D., F.R.C.P.;
Physician to the Richmond, Whitworth, and Hardwicke Hospitals.

[Read in the Section of Pathology, January 5, 1894.]

The case which I now bring forward is that of a man, J. B., aged 49, an army pensioner, who was admitted to the Whitworth Hospital on December 28th, 1892, complaining of swelling in his right knee and general difficulty of walking.

He gives a history of having had a spear wound in his right side in 1865, while fighting in New Zealand, and afterwards, about four years ago, he got hurt in the same side while fencing. Necrosis of a small portion of a rib was the result, and then he completely recovered after some small operation in hospital.

His father and mother died at an advanced age, about 70, and an uncle died of some form of paralysis. He admits to no history of syphilis, or excess of any sort.

About three years ago the patient noticed a weakness in his left knee, which caused him some unsteadiness in gait, but otherwise he was all right. About four months after this a weakness of the calf of his left leg set in, accompanied by severe pains, which resembled the shock from an electric battery. These pains were intermittent in character, lasting off and on for about 24 hours, and were confined to the calf of the same leg. He also complained of a tightness in his abdomen, as if he was encircled by a cord; his bowels were confined, his urine occasionally dribbled away involuntarily, and he also got slightly deaf.

Twelve months after this his right leg became affected

in a similar manner to his left, but then for a time he appeared to improve.

A few months subsequently he got spasmodic fits of "choking," occurring a few times a day, and then he would be free from them for a week or so. These fits commenced with a tickling sensation, starting from the pit of his stomach.

A year before his admission he had an attack of facial paralysis on the right side. He was unable to frown or shut his right eye, which watered profusely; he was also unable to whistle, and his mouth was drawn up to the left side.

Eight or nine months after this he got a fall off a vehicle, striking his right knee against the ground, and at that time he felt "something give." The knee rapidly swelled, but was comparatively painless. It increased and diminished in size from time to time, and in about a month after the accident it began to bend backwards. After some weeks he went to the Richmond Hospital, and his disease being recognised by my colleague, Mr. Thomson, he was transferred to the Whitworth Hospital.

The notes of his case on admission are as follows:—

The patient is a tall, gaunt, dark-complexioned man of a very discontented expression, and shows signs of old right facial paralysis. His weight is 10st. 8lb., and he says he was 12st. 7lb. some years ago.

His voice is considerably impaired owing to partial paralysis of the adductor muscles chiefly, and his speech is also thick and sometimes understood with difficulty, owing, apparently, to impaired tongue movements. While in hospital subsequently he had several attacks of laryngeal dyspnœa. His pupils are markedly myotic, the Argyll-Robertson phenomenon is well developed, and both upper lids droop, at one time more than another; he has no colour blindness or diplopia.

From Photo

DR NUGENT ON CHARCOT'S DISEASE.

F Huth, Lith. Edin.

He suffers much from constipation and occasionally severe pains in the stomach, but never, while under observation, had what could be described as a gastric crisis.

As regards his method of locomotion, this is considerably modified by the condition of his knee.

He can only progress with extreme slowness and with the aid of two sticks, stooping forward, and when he rests the weight of his body on his right leg the retroflexion of the right knee is such as to cause apprehension of the condyles of his femur bursting through the skin. (The photographs exhibited to the Academy did not give a full idea of this condition, as they were taken when he was to a considerable extent supported.)

The knee-jerks are lost and plantar reflexes diminished.

His ordinary sensation is diminished, and that to a smart prick of a needle distinctly delayed. He complains of slight paræsthesiæ, such as tingling, &c., but not to any great degree, and allocheiria, though sometimes to be observed, is not a prominent symptom.

As regards his urinary system, he has to pass water frequently, rising often at night, and occasionally has slight incontinence. His urine is alkaline, contains large quantities of pus, and occasionally a little blood.

The condition I have briefly described remained much the same during his five months' residence in hospital until about three weeks before his death. His bladder symptoms then rapidly became worse, he positively refused to have anything done for him, such as the washing out of the organ and other treatment to which he had previously submitted, and he gradually sank and died on April 11, 1893.

In addition to what I have stated with regard to the condition of his knee joint during locomotion, I may say that the veins over the joint were considerably distended, and that in circumference it measured at times 4 or 5 inches more than

that of the opposite side. After rest in bed for some days this increase in size, which was obviously due chiefly to fluid effusion, gradually subsided, and then some grating could be felt, but only with difficulty developed. The articular ends of the tibia and fibula appeared to be enlarged. The right elbow joint also appeared to be somewhat enlarged, the olecranon standing out prominently.

The *post-mortem* examination revealed the condition of the knee joint to be now described.

Muscles.—The muscles in the neighbourhood of the joint are all well developed, especially the plantaris.

Capsule.—The capsule is greatly thickened, especially on either side of the ligamentum patellæ.

Ligaments.—The external lateral ligament is rather thickened, but the internal appears normal.

Joint cavity.—On the joint being opened the synovial membrane is found to be much thickened, both the part covering the non-articular surface of the bone and that lining the capsule. Numerous little bands pass across the angle of reflection. Small pedunculated bodies, hard to the touch, project into the joint cavity. In the neighbourhood of the patella the membrane is roughened and has a warty appearance consisting of small pedunculated bodies. A large tough fringe projects for about half an inch into the interval between the lower end of the femur and upper end of the tibia.

Lower end of Femur.—The lower end of the femur is enlarged. The cartilage which should cover the articular surface is in parts eroded, and the eburnated bone shines through. The margin of the articular surfaces above projects abruptly and is irregular and lipped, and overhangs the non-articular surface of the femur. On the lower portion of the condyles the cartilage is also partially eroded, and there are elastic elevations projecting from the non-eroded surface.

Posterior surface of Joint.—On looking at the posterior surface of the joint synovial fringes are seen overlapping the condyles; the cartilage covering the condyles is eroded in places, and irregular bony outgrowths project from the upper part of the condyles. The capsule of the joint over the outer condyle is greatly thickened, and over the internal condyle the bursa under the inner head of the gastrocnemius communicates with the joint.

Patella.—The patella is transversely enlarged and slightly diminished in size from above downwards, the cartilage covering it is eroded, and the same bony lip projects from its upper border as in the case of the femur.

Upper end of Tibia.—The upper end of the tibia is enlarged. The cartilage on the upper surface is eroded in a similar manner to the condyles of the femur, and bony outgrowths project from the anterior space between the tuberosities. The transverse ligament is well developed and clearly seen. The anterior crucial ligament has practically disappeared, but the posterior one has only partially done so; the synovial membrane covering these is thickened and fringed. The semilunar cartilages, however, appear normal.

I would wish to say a few words with regard to the history of the disease.

In 1868 Professor Charcot first drew attention to the arthropathy occurring in locomotor ataxy, and gave as its chief points, considerable hydrarthrosis and a diffused swelling extending beyond the joint, of hard consistence, and not presenting the ordinary features of œdema. It was not accompanied by fever or pain generally, was sudden in its accession, and might cause irremediable destruction of a joint in days or weeks. Sometimes the swelling would disappear and the joint return to its original condition, but frequently there was rapid absorption of the articular extremities.

In 1869 Dr. Ball, Professor at the Paris Faculty of Medicine, gave particulars of 18 cases occurring in different joints, but especially in the knee.

He draws particular attention to the rapid development of hydrarthrosis and the absence of inflammatory action, and in pointing out the different features to be found in chronic rheumatic arthritis he states that the progress of the atrophic process is much more active in the spinal form, and that in chronic arthritis there exists a flattening and augmentation in the size of the articular surfaces not to be found in spinal arthropathy; that the lesions in the hard parts in the neighbourhood of the affected joints are best expressed by the opposing terms hypertrophy and atrophy, especially when the affection attacks the knee joint. The volume of the bones, as well as the transverse diameter of the patella, undergo a manifest increase in size, while the femur and tibia become the seat of voluminous abnormal development, and the articular extremities become rapidly atrophied, as is shown by their partial dislocations and their præternatural mobility.

The occurrence of spontaneous fractures having been brought forward in 1873, Charcot makes the following statement:—The fault of nutrition due to an influence of the nervous system, which makes the bones fragile and thus leads to spontaneous fracture, is also one of the principal elements which combine to the production of the arthropathies. The extremely rapid and extensive wearing away of the articular extremities is the principal character which distinguishes ataxic arthropathy from common dry arthritis.

Talamon states—Destruction and disappearance, partial or complete, of the epiphyses, fragmentation and absorption of the head of the humerus in one case and atrophy of the projecting portions, such are the principal and always

identical alterations of the osseous extremities that have been met with in the shoulder, hip, and knee. In no case have there been observed the hyperostoses, and epiphysial hypertrophies which characterise dry arthritis.

The connection between arthropathies and disease of the spinal cord is not yet explained. The presence of disease of the anterior cornua has not been proved, and a number of German pathologists are inclined to believe them to be the result of anæsthesia interfering with voluntary and automatic joint protection.

In November, 1884, Dr. Morrant Baker read details of three cases of joint disease in connection with locomotor ataxy before the Clinical Society of London, and the matter was there very fully discussed.

Dr. Baker started the discussion as to whether this disease was a new disease or one long known as chronic rheumatic arthritis, and, if so, what was the connection between arthritic disease and locomotor ataxy. He believed that arthritis deformans was characterised by the same anatomical and pathological lesions as those met with in Charcot's disease—viz., eburnation, osteophytes, and fibrous degeneration of cartilage, with wearing away of bone, &c. He looked on the two diseases as not cause and effect, but dependent upon some pre-existing depraved condition common to both, of which the effects are seen most clearly, sometimes in disease of the nervous system with its direct consequences, sometimes in disease of the joints, sometimes in both.

The general result of the discussion was in favour of the opinion that the joint affection arose from the same cause which underlies the more simple symptoms of the nervous disease, and as arguments in favour of this were adduced the facts that the changes in the texture of the bones, such as softness and fragility, frequently accompanied the changes in the joints, and that the latter in many cases corre-

sponded in time with other trophic changes and lancinating pains.

In this discussion Hutchinson and Moxon opposed the view of Charcot as to the direct trophic influence of the nervous system, and the former was inclined to refer the joint disease to the dulness of sensation, which he believed to be the chief cause of perforating ulcer of the foot without referring to the trophic system.

Sir J. Paget and Drs. Barwell and Broadbent were, on the other hand, inclined to think that the joint affections were not of rheumatic or traumatic origin, but signs of the nervous affection.

The case before us corresponds in many ways with the majority of those described. The symptoms were extremely rapid in their progress; swelling quickly supervened without heat, redness, or pain. In about five weeks from the first appearance of the swelling the patient noticed the commencement of the retroflexion of the knee I have already described.

The specimen before us has some characters to which I would draw attention—namely, the absence of the rapid absorption of the articular ends of the bones, to which all observers have drawn attention as occurring in the majority of cases; the presence of small bony growths, and in some places of eburnation; the rapid destruction of the interior ligaments, producing præternatural mobility; and the absence of fixation, or limited movement, frequently to be met with in rheumatic arthritis.

Dr. J. A. Scott kindly examined the spinal cord microscopically, and reports that it presents the appearances found in locomotor ataxy. The posterior columns are in all parts degenerated. In the cervical and dorsal regions the postero-internal columns are in an extreme condition of degeneration, while the postero-external are less affected.

In the lumbar region both columns are equally changed, but not to such a degree as the postero-internal columns higher up. The cells in the grey matter stain badly, and many of the cells in the anterior horn in all parts of the cord are pigmented and granular. The cerebellar tract is unaltered.

The other specimen on the table, kindly lent to me from the Museum of the Royal College of Surgeons, is one described by Dr. Leeper, in 1889, in the *British Medical Journal*, and represents the condition as occurring in the shoulder of a tabetic. In it the wasting process is advanced. The head of the humerus is separated from the shaft and lies alongside it, the glenoid cavity has disappeared, and the bone lies in the subscapular fossa, surrounded by osteophytes, and soft tissue containing hard masses, probably of the same nature—in fact, the whole osseous and ligamentous portions of the joint are totally disorganised.

I thought this case worth bringing before the Academy owing to the somewhat rare occurrence of the disease, and also because, as far as I can find, this is the first specimen of a tabetic joint laid before a scientific society in Dublin.

Mr. Chance asked could Charcot's disease of the joints exist without there being any nervous symptoms? In a case he operated upon his patient had a large swelling of her right shoulder. There was no pain, no redness, no increased heat to be felt. It was suggested that the case might be a sarcoma or some slow inflammatory condition. Movement was free, except for the mechanical interference presented by the large swelling. On the joint being opened, about half a pint of clear yellow fluid was found; the glenoid cavity was deprived of cartilage, and the head of the humerus was greatly damaged. The joint was closed, and two years later the woman had perfect movement in it. She had no tabetic symptoms.

Dr. Nixon asked what was the condition of the knee joint of the other limb? The displacement in this case was interesting.

In two other cases he had seen the displacement was in an outward direction, and both limbs were affected, one more than the other.

Dr. O'Carroll asked might the condition of the joint be due to a neuritis descending from the spinal cord? Might the perforating ulcer of the foot, and the skin atrophy also, be due to the same cause? Do these conditions occur at the neuritic stage?

Dr. Doyle said that in some cases of chronic rheumatic arthritis which he had seen there was more eburnation of the bones. A greater number of joints were affected as well.

Dr. Nugent, in reply, stated that as regards Mr. Chance's question he was unable to give a satisfactory answer. Similar cases had been brought before the Clinical Society of London, and no definite opinion had been arrived at. Many observers asserted that chronic rheumatic arthritis and Charcot's disease of the joints were the same. Charcot himself admitted that a tabetic patient might be attacked with chronic rheumatic arthritis, and that if he was one could not distinguish the two. In reply to Dr. Nixon, he stated that during life the left knee appeared perfectly normal. It was not examined after death. If his patient had lived longer, the articular ends of the bones of the right knee might have gone on to absorption.

FRACTURE OF BASE OF SKULL.

By E. H. BENNETT, F.R.C.S.;
Surgeon to Sir P. Dun's Hospital;
Professor of Surgery, Trinity College, Dublin.

[Read in the Section of Pathology, February 16, 1894.]

I SUBMIT the record of a case of injury of the head, which presented very unusual symptoms during the short time that passed between the patient's admission to hospital and his death.

The patient died on the morning of the third day. He was admitted to Sir Patrick Dun's Hospital on the morning of December 15, 1893, about ten o'clock, and I saw him at the time of his admission. He was then deadly pale, with a pulse of 60, and very violent, and incapable of understanding any word spoken to him. He was restrained by four men, who held his arms and legs, and the skin above each wrist and ankle was noticed in the evening to be marked by many blood stains, caused by the tightness of grasp necessary to control his struggles. When he was placed in the basket chair, used for carrying delirious patients to the wards, he leaped and struggled against the broad leather strap which confined him.

His left malar and temporal regions were swollen and livid from blood effusion, and there were two small wounds in this swollen region—one above and behind the ear, and the second over the masseter muscle. A small quantity of blood had been shed over the surface about each wound, and there was coagulated blood filling the left nostril.

On being put to bed he continued to shout and struggle, and was with difficulty kept in bed. Towards evening he

seemed exhausted, and it was easier to keep him in bed, but he muttered the same words incessantly. His temperature was now 101·2°. He had a slight flow of blood from the nose, which was controlled by a plug of cotton wool placed in the nostril. He was delirious during the entire night, trying to get out of bed and muttering continuously. On the morning of the 16th his temperature was 101°, and in the evening of that day it rose to 102°. There was not any material change in his delirium during the night; in the morning the temperature rose to 105°, and shortly after this point was reached the man died. Throughout no paralysis was observed, and the urine and motions were passed under him. The accident that happened to this man was this—he was found lying in a semi-conscious condition in the mash room of a distillery, near the hospital, bleeding from the wounds of his head, and from his nose; beside him was a crowbar. Nobody saw the accident happen. He was aged thirty years, and remarkable for his skill and sobriety, so that he was entrusted with the more important duties of the store. His duty was to ungear the machinery at stopping times—for breakfast, dinner, &c. It appeared he was in the habit of doing this by using a crowbar against some part of the moving machinery. The inference is that by some accident the crowbar got fast in the machinery, and was so whirled round, and that in its circuit it struck him on the head.

The examination of the head reveals a fracture of the skull, passing, from the site of the wound above and behind the ear, obliquely forward above the level of the petrous portion of the temporal, into the middle fossa of the skull, beside the body of the sphenoid bone, into the anterior fossæ, where it terminates in comminutions of the cribriform plates of the ethmoid. Over this line the brain was much bruised and stained by blood, and this damage and staining

are most evident in the parts of the brain lying over the anterior extremity of the fracture, where, as everyone knows, the commotion of the brain in such injuries is generally greatest. Now the course of this fracture is very slightly different from the common fractures of the base, in that its direction is from behind forward, and that it avoids the petrous portion of the temporal bone, but these are the result of the direction of the blow.

There is nothing in these lesions to explain the almost immediate developement of delirium ferox, and the rapid rise of the temperature. At the *post-mortem* examination no trace of inflammation of brain or other organ could be found. The delirium and fever must then have arisen from the cerebral lesion, or from the coincidence of some essential fever. It has occurred to me that a sudden attack of influenza might explain the occurrence of the accident—causing the man to make a mistake in the execution of a work that was most familiar to him, and that so the combined injury and fever would explain the clinical symptoms better than any appeal to cerebral injury only.

FRACTURE OF THE PATELLA.

By E. H. BENNETT, F.R.C.S.;
Surgeon to Sir P. Dun's Hospital;
Professor of Surgery, Trinity College, Dublin.

[Read in the Section of Pathology, February 16, 1894.]

SOME one has written that an osseous union of fractured patella may be rendered more likely to take place by a coincident fracture of the shaft of the femur, allowing the quadriceps extensor femoris to be relaxed, by approximation of its origins and insertions. I must have read this statement, but I cannot recall the authority, although I have searched with some diligence the five and twenty columns of the American Index which are devoted to the word "Patella." Since 1810, when it was first proved by the production of the pathological specimen that bony union was a possibility in fracture of the patella, many examples have been recorded, most of these being comminuted fractures. There are, however, sufficient to establish the occurrence of osseous union in the transverse fracture, and of this I have myself recorded an example.

The specimen I now exhibit is one of very complete union in the comminuted fracture, and with it I have preserved the femur, and knee joint, and the opposite patella. The form of fracture of the femur, ordinary oblique near the centre, is such that it is quite possible—more than that, very probable—that the two fractures were the result of a fall on the knee, and were coincident. In the absence of any life history of the specimen we cannot go further. The completeness and regularity of the osseous union, makes it probable that the broken femur may have had a good share in its production.

I present the specimen as interesting for the completeness of the bony union of a comminuted patellar fracture, and its association with oblique fracture of the shaft of the femur, such as results from falls on the knee.

Dr. Myles asked did the two fractures occur simultaneously? He also alluded to Professor M'Ewen's theory, by which he explained the frequent want of osseous union in fractured patella. The atmospheric pressure was supposed to force the aponeurotic structures in front of the patella between the fragments.

Dr. Bennett, in reply, stated that he considered it quite possible, and even probable, that the two fractures occurred simultaneously. He considered that the explanation of frequent non-bony union was separation of the fragments. There was always plenty of fluid effused into the joint to lift up any aponeurotic structures which might have fallen in.

SECTION OF STATE MEDICINE.

RECENT DEVELOPMENTS IN STATE MEDICINE.

By D. EDGAR FLINN, D.P.H., F.R.C.S., M.R.C.P.;

Examiner in State Medicine, Royal Colleges of Physicians and Surgeons, Conjoint Board;

Fellow and Member of Council, British Institute of Public Health.

[Read in the Section of State Medicine, February 9, 1894.]

At the meeting of the Sanitary Congress, held at Dublin in 1884, now just ten years ago, I communicated a paper on the administration of the Public Health Act in Ireland, which elicited a discussion not without interest, in which Sir Robert Rawlinson, C.B. (the President); the much-regretted Dr. Alfred Carpenter, of Croydon; Professor De Chaumont, F.R.S., of Netley; Sir Charles Cameron, and others, took part. Since that time considerable developments have taken place, and the administering of the Public Health Acts has undergone an improvement for the better. The Legislature has aided in this direction, and the passing into law of such useful measures as the Housing of the Working Classes Act, the Infectious Diseases Notification Act, the Open Spaces Act, the Contagious Diseases Act, the Factory and Workshops Act, the Margarine Act, have all had a useful and far-reaching influence. The improvement consequent on this legislation, though slow in making itself felt, will eventually have a good effect; and though our Irish public bodies yet lack energy in moving forwards on the questions immediately affecting the health of the people, there is a visible improvement in the conditions which existed some years

ago, and there is some inclination shown to carry out the State enactments relating to health. The cry of not burdening the overtaxed ratepayer is, however, yet heard; but the creation of an intelligent public opinion grows more and more every year, and the nationalisation of the questions of health economy now runs side by side with the nationalisation of education. It is probable that when the advantages accruing from sanitary science, taken in the broadest acceptation of the term, become better known, the prospects of Irish public health administration will become much brighter.

Quite recently it has been suggested that the time has now arrived when a Minister of Health should be appointed by the State. Sir Benjamin Ward Richardson some years ago strongly advocated the appointment of such a Minister. It is doubtful, however, whether the country is even yet ripe for such a departure; but the day is not far distant when this question will seriously engage the attention of the Government of the day.

It has with truth been said that panic is the parent of sanitation, and if we look back to the history of public health legislation for the past half century or more, we must recognise the force of the remark. As far back as the commencement of the eighteenth century, Dr. Mead, a distinguished physician of that day, and endowed with ideas much in advance of his time, strongly advocated the formation of a central Board of Health, and it was just a century later that any practical measures were taken towards the consummation of that object.

In 1842 Sir Edwin Chadwick issued his Report on the "Sanitary condition of the Labouring Population of Great Britain." The effect of this Report was very marked, and it, no doubt, initiated the era of collective action as regards legislation directed to the preservation of the national

health. A Royal Commission followed the appearance of this Report, and this was the first direct step in the advancement of Sanitary Legislation. It undoubtedly appears to have been the first move of the Government of that day to recognise the public health as a State interest. A year or two later the first appointments of medical officers of health were made in England—viz., in London and Liverpool—under the influence of the terror of an outbreak of cholera in 1848. A Board of Health was established, and it was during the prevalence of this epidemic that those searching inquiries were instituted by the Government which led to the discovery that the spread of the disease was due to the pollution of water by the intestinal discharges of patients. That discovery, alarming as it was at the time, had most beneficial and fruitful results. It demonstrated the importance of the purity of water-supply; it, moreover, proved the necessity for proper systems of drainage, and helped very materially to lay the groundwork for the many subsequent sanitary reforms which have been inaugurated; it further paved the way for the elaboration of a system of vital statistics which has been so invaluable to the country.

In 1866 there was again a revival of a cholera scare, which gave an impetus to fresh sanitary legislation, and in 1872 provision was made throughout Great Britain for a complete system of sanitary organisation, and the universal appointment of medical officers of health. Following upon this came the enactment of the Public Health Act of 1875, and the Irish Public Health Act of 1878. The occurrence of a number of cases of cholera in England in 1893 was again the cause of increased sanitary activity, and to this activity may be attributed the comparatively brief sojourn of the disease, which at one time threatened to assume a widely epidemic form. The sanitary defences of the

country were so thoroughly and rapidly organised that the complete stamping out of this dreaded malady was accomplished in a short time, and it will be admitted that this rapid "stamping out" was a distinct triumph for State Medicine, and proves what efficient public health administration can achieve, and, moreover, marks with emphasis the advances that have been made since the former cholera outbreak of 1866, and in this connection I may mention that the International Sanitary Conference, which met at Dresden last autumn and has now resumed its sittings at Paris, is also a distinct landmark of importance in the history of State Medicine, being the first time for many years that concerted action of this nature has been undertaken by the British and Continental sanitary authorities.

The Bill before Parliament now, which is known as the Parish Councils Bill, will not very much affect sanitary questions, though indirectly it will have an effect on the duties appertaining to Boards of Guardians, whose duties will, if the Bill becomes law, be confined to Poor-law administration solely.

The Infectious Diseases Notification Act of 1889 also marks an important stage in public health development in our time, as the exact localisation of disease, especially of an infectious character, is the very essence of, and is a direct aid to, effective sanitary administration; the very fact of the notification of an infectious disease in a crowded population must have far-reaching and beneficial results. To ensure these results in their entirety compulsory powers are necessary, and had the Act in the first instance carried with it compulsory clauses, the interests of local public health administration would have been much better served. By this Act, wherever adopted, we are enabled to isolate infectious cases, limit an outbreak of disease, define clearly the areas where illness exists, and thus trace

the unsanitary condition and causes by which they are spread amongst a community—all of them vitally important issues, and yet there are some who use every endeavour to discredit and thwart the operation of a measure that in this country is so distinctly indicated. It has been calculated that nearly a quarter of a million of people die annually in Great Britain and Ireland from preventable diseases, and it stands to reason that if we had the system of compulsory notification and registration of disease strictly administered, the number would be very much diminished. A large percentage of the mortality occurs amongst the labouring classes, whose lives are spent in the midst of the most unsanitary conditions. It is in the surroundings of this class of the population that epidemics of infectious disease have their origin, and no system of notification and disease registration should be considered stringent that would assist in stamping out diseases that cost the State annually so many valuable lives. The *laissez faire* system has had a trial, and the successful administration of this Act will never be attained until compulsory notification becomes the law of the land. In the ensuing session of Parliament, notice has been given by Mr. A. Thomas, M.P., tending towards the consummation of this object.

In connection with the notification and registration of disease, it is evident that the medical officer of health will, in the future, play a much more important part than hitherto, and we are within a measurable distance of the time when valuable facts and figures will be forthcoming to prove the necessity for a rigorous administration of the Act.

In those countries in which the notification of infectious diseases has been carried out more thoroughly than in England, the results are, as might be expected, satisfactory.

Thus, at the London meeting of the International Congress of Hygiene, Dr. Hewitt, of Minnesota, remarked that in his own State a Notification Act had been passed at the request of the people, and had been in force for eight years. Before this Act was passed, out of a population of 600,000, there were 1,200 deaths from diphtheria per annum; now the population had more than doubled, while the annual deaths from diphtheria had fallen to 761. Anent this, Dr. Thorne Thorne, in a recent address at the Sanitary Institute, drew attention to the fact that diphtheria had lately considerably increased in Great Britain. In Montreal, again, stringent notification regulations are in force, with the result that "epidemic diseases are becoming rapidly stamped out." The Congress, hearing the objections to the notification system, almost unanimously passed a resolution that "Notification of infectious diseases in all countries should be compulsory."

One of the best systems at present existing for the notification of disease is that which has been established at Zurich as the result of experiments which have been carried on for many years. A Board of Health for the town is established in the office of the police, whose duty is to attend to the sanitation of the town, its water supply, and all questions affecting the health of the inhabitants. To this office all communications concerning health and sanitation must be sent; and prompt action when necessary is immediately taken by the health inspector. Every case of sickness to which a medical man is summoned must be reported by him direct to the Health Bureau on his first visit; if of infectious type, whether mild or virulent, no choice is permitted, his report is compulsory. All medical men are officially supplied with a book of printed forms. Where summoned, the medical man only is required to report; dual notice to the officials, as in the English Act,

is not required. Should a case of infectious disease occur in which the doctor fails to report, he is liable to a penalty of from 10 francs to 100 francs, unless satisfactory evidence is given that the omission was unintentional; on a second omission the penalty may be increased to 200 francs. In every return of puerperal fever the doctor must give the name and address of the nurse in attendance, so that she may be brought under the more immediate regulations provided in such cases. By this means slow or rapid dissemination is immediately traceable. From these reports the central Board of Health issues weekly a most important table, giving the number of new cases occurring in the previous week. A copy of this table is sent to the doctors and members of councils.

The Housing of the Working Classes Act of 1890 has not been availed of as largely as might have been expected; to an extent this might have been anticipated, as far as Ireland was concerned, for our local bodies are not so easily moved to take action in questions that they consider may involve a large outlay. They take, as it were, a long time to develop new ideas, and much prefer to allow matters to remain as they are, or rather as they found them.

Boards of Guardians are keenly jealous of their local reputation in this regard, and appear to consider it to be their first duty to economise the expenditure of public moneys, even at the expense of the health of their constituents. Urban sanitary authorities err in the same direction, and are fearful of embarking on any scheme of sanitary reform that may involve them in a conflict with the ratepayers; thus, the Housing of the Working Classes Act remains to an extent inoperative, with the result that the percentage of towns that have availed of its provisions is comparatively small. It seems, however, probable that

in the near future, when the benefits of the Act become better known, it will be more generally adopted.

The position taken up by Boards of Guardians as sanitary authorities has been very accurately described by Sir Francis MacCabe, who has had a wide and varied experience as to the manner in which these bodies discharge their public duties. At the Congress held in Dublin, under the auspices of the Sanitary Institute, in 1884, after referring to these bodies as administrators of the Public Health Acts, and after bearing testimony to the readiness that they had evinced to make due provision for the protection of the public health according to their lights, Sir Francis said:—"There can be no doubt that very imperfect knowledge is possessed by Boards of Guardians on the subject of the economy of Sanitation as a security against disease, suffering, and death. They have never had any precise information placed within their reach respecting the amount of preventable disease, suffering, and death, with consequent loss of wage-earning or productive power, which may be avoided by the provision of suitable drainage and pure water. They have regarded only the direct cost, without taking into account the indirect gain, which I believe would fairly more than counterbalance the much-dreaded taxation."*

The condition here described has, to an extent, undergone some improvement, but even yet the sanitary authorities throughout the country take a considerable time to move in any measure of health reform. For instance, the question most vital to all, of a pure water supply, is approached in a lukewarm manner, and in some instances it has taken years to convince some of the largest corporations of the necessity of procuring water from a pure source. At the present time the vast majority

* On the Water Supply and Drainage of Small Towns in Ireland.

of towns in Ireland depend for their water supply upon wells, mostly of a shallow nature, and liable to soil pollution, and although the danger is pointed out that these sources are easily contaminated and dangerous to health, the sanitary authorities evince no keen desire to improve matters. They may be advised, and, mayhap, appear convinced, that one of the very first essentials for the healthy life of any community is an abundant supply of pure water, yet, when it comes to the question of the outlay, they are loth to proceed further, and they postpone its consideration for an indefinite term. The wholesome dread of an outbreak of infectious disease is a potent educator, and it is remarkable how intensely active our urban and rural sanitary authorities become when they realise the possibilities of their being overtaken by some epidemic of infectious disease. A chronic condition of scare would do much to urge on promptly those health reforms so much required in the country.

The State inspection of industries is a branch in which improvements have been much needed, though the inspection of the conditions of health in occupation is still in a rudimentary form amongst us, as evidenced by the fact that there are yet a large number of occupations absolutely free from inspection. Women's work, until very recently, was never considered as necessary to be included in the duties of an inspector, and it was only last year that women inspectors were appointed, in two instances, to aid in the administration of the Factory and Workshops Act. There is annually a large sacrifice of human life through accidents, unwholesome trades and occupations, which might to an extent be avoided. In England, of 527,000 persons employed in coal mining, 100,000 are disabled for a longer or shorter period every year, and there are about 1,000 killed. Now, taking this one branch of industry

alone, does it not seem probable that a closer system of inspection is necessary, and a more complete and thorough supervision indicated. It has been over and over again pointed out that the number of industrial inspectors is so absolutely inadequate that they take years to get through a cycle of their duties, the consequence being that certain occupations and trades go absolutely free without inspection for very long periods.

The establishment of County Councils in England has indirectly been an impetus to the advance of State Medicine, and the position of the medical officer of health has improved vastly in consequence. Up to recently there was a large number of towns which had medical officers of health with small salaries, and who were allowed to practise their profession in addition; now an entirely new order of specialists is being appointed, and counties, and portions of counties, are placed solely under the charge of one official, who is responsible to the County Council for the due administration of the Public Health Acts; he is debarred from practice, and devotes his whole time to the supervision of sanitary affairs. Thus the position of the medical officer of health in the sister country is very much better than it was some few years since, when he had both public and private interests to consider. The State is now served by an officer specially educated, adequately remunerated, and untrammelled in the discharge of his public duties, and the entire machinery of sanitary administration is improved in consequence. It is possible that in the future a similar reorganisation may obtain in Ireland, and that combination of districts for health purposes may be established. The present administration of the duties of medical officers of health is admittedly weak, and the State, sooner or later, will be necessitated to provide a remedy. The difficulties in the

way of the medical officer of health in Ireland are many; his duties and his interests very frequently lie in direct antagonism to each other. The consequence is that, per misadventure, he is guilty of the offence of indifference, and mayhap negligence, with the result that the State loses directly by the maladministration of its own enactments. To cite an example—the Housing of the Working Classes Act of 1890, an Act passed to amend the Acts relating to Artisans' and Labourers' Dwellings and to the Housing of the Poor, is an enactment in every way calculated to benefit the community at large. Anything that would aid in the abolition of the wretched hovels that abound in such large numbers in our Irish towns, one would imagine, should be largely availed of. But what is the fact? From an unique aggregation of circumstances, hardly any advantage has as yet been taken of this Act, or was formerly taken of the previous enactments that it repealed. One of the initial steps in securing to a town the benefits of this Act must be taken by the medical officer of health. Under Part I., dealing with "unhealthy areas," section 5 ordains:—

(1) An official representation for the purposes of this part of this Act shall mean a representation made to the local authority by the medical officer of health of that authority.

(2) A medical officer of health shall make such representation whenever he sees cause to make the same; and if two or more justices of the peace acting within the district for which he acts as medical officer of health, or twelve or more persons liable to be rated to the local rate, complain to him of the unhealthiness of any area within such district, it shall be the duty of the medical officer of health forthwith to inspect such area, and to make an official representation stating the facts of the case, and

whether in his opinion the said area or any part thereof is an unhealthy area or is not an unhealthy area.

Now, it nearly always happens that a considerable percentage of the "unhealthy areas" in our Irish towns are owned by that class of the ratepayers who contrive to get themselves elected to representative positions; their local influence is thrown into the scale against any improvements being carried out, and the medical officer of health is either unwilling or hesitates to take action. The consequence is that the beneficent operations of this and other kindred Acts remain in abeyance, and tacit obstruction and delay are the inevitable result.

SOME POINTS IN CONNECTION WITH THE ADMINISTRATION OF HOSPITAL RELIEF.

By H. C. TWEEDY, M.D. Dubl.;

Fellow and Examiner, Royal College of Physicians of Ireland;
Diplomate in State Medicine, Trin. Coll. Dubl.;

[Read in the Section of State Medicine, April 20, 1894.]

Dublin is proud of her hospitals—naturally proud of them, justly proud of them. From the year of grace 1720, when the first general hospital was founded by Madam Steevens, of happy memory, down to the present day, the work done in them has been of incalculable service to our less fortunate fellow-countrymen, and at no period of their existence have they reached a higher level of efficiency than at the present time.

This is as it should be; and it is the ardent desire of every lover of his country that they should be maintained in a state of excellence worthy of the fame of the Dublin School of Medicine. It is, therefore, with regret that we observe signs—slight signs, it is true, but not the less requiring our vigilant attention—that our hospitals are in danger of being utilised by the general public in a manner never contemplated by their pious founders.

The functions of a Dublin hospital are manifold. In an address delivered some years ago by Dr. Grimshaw he thus summarises the essential conditions to be fulfilled by them:—

"1st. As charitable institutions for the relief of the sick poor of Dublin and its immediate vicinity.

"2nd. As institutions for the prevention of the spread of infective disease.

"3rd. As charitable institutions affording special opportunities for the resort of special cases, seeking specially skilled medical and surgical advice; thus affording to the poor in the remote districts in Ireland the advantages attained by the rich, who can afford to visit consulting physicians and surgeons at metropolitan centres.

"4th. As educational institutions—

(*a*) For medical students.

(*b*) For nurses."

There are many persons who believe—and no doubt with a great deal of truth on their side—that the amount of intern hospital accommodation in Dublin is in excess of the needs of the population. On that question I do not wish to speak now more than incidentally; but I would ask your attention to two points in connection with the administration of medical charities—viz., the question of—

(*a*) Pay wards in hospitals.

(*b*) Out-patients.

In both of which departments there is a growing need for some radical changes.

Let us take, first, the question of pay wards. These were originally established to meet a great want. There is a large class of persons—clerks with small salaries, ladies in reduced circumstances, &c.—who, in the case of severe illness, or some serious operation, would be quite unable to pay for the necessary nursing, not to speak of doctors' fees. To such persons the pay ward in a large hospital is an ineffable boon. There they pay a sum varying from 10s. to £2 2s. per week, for which they get the necessary board, nursing, and medical attendance. But gradually a privilege, that was intended only for persons in specially straitened circumstances, is being usurped by—I will not say a better, but a better-off class.

Whether private patients should be admitted at all into a

charitable institution is a matter open to discussion, but when persons in good circumstances come into a hospital as private patients, at a nominal charge, either from motives of economy, or for greater safety in the case of serious operations, the responsibility becomes a very grave one for those who permit such a flagrant abuse of a charity. And what does the hospital gain by such cases? Little or nothing. The cost of an ordinary patient per diem is 3s. 9d., if we include maintenance, establishment, and management. Few pay-patients give more than £1 1s. per week, so that in the majority of instances the hospital loses at least 5s. 3d. per week, not to mention the fact that such patients cost considerably more for maintenance, inasmuch as they require many additional comforts not supplied to ordinary patients.

But what about the doctors? Surely, "sufferance is the badge of all our tribe." In most of the Dublin hospitals the position of physician and surgeon is an honorary one.

The staff receive their share of the students' fees, and nothing more, save the privilege of using the ordinary patients as teaching material. The pay-patients, however, are not thus available for instruction; they or their friends would resent anything of the kind. Nor can the doctor receive any fee from them. Not only is it a matter of honour with him to take no fees from hospital patients, but were he found doing so, his hospital would receive no grant from the Hospital Sunday Fund, one of the fundamental rules of the charity being as follows:—

> "Any hospital the governors of which permit a medical officer to receive a fee from a patient of their hospital, for any services rendered while in the hospital, shall not be allowed to participate in the fund."

I do not believe that there is any physician or surgeon

who would not with the utmost cheerfulness bestow his time or his skill to aid in relieving the sufferings of some poor clerk or distressed lady—even although the duty may have been inconsiderately thrust upon him by the Board of his Hospital; but I maintain that if pay-patients are to be taken into our hospitals at all, their circumstances should be rigidly inquired into, and none received, as such, save those who are absolutely unable to pay for, in their own houses, the advice and the nursing that they need.

But after all, why should it be necessary to burden a charitable institution with this class of patients? It is true that their means would not permit them to avail themselves of the advantages of the many private hospitals which already exist in Dublin; but we hope, perhaps before long, to see established in our city institutions which would meet their requirements—private hospitals, established as such, and in their construction and management thoroughly up to date. Such institutions exist in London, Berlin, and other places—some the result of private enterprise, and others worked by limited liability companies; and I believe that private hospitals, started upon the lines I venture to indicate, could be worked with profit to their proprietors, as well as with advantage to their clients. Such a hospital should have three grades of payment—first, second, and third class—and should have a fully qualified resident medical officer. First-class patients should have, each, separate rooms, and should pay for their own nurses, whose services should be placed at their entire disposal. Second-class patients should be placed two or three in one room, and should be charged proportionately less than those in the first-class. Third-class patients should be six or eight in a room, and should be taken on as moderate terms as possible. In Berlin this can be done for 3s. a day. All patients should be equally entitled to the services of the

resident medical officer, but should they desire any further advice they should be at liberty to employ any doctors they pleased *at their own expense.* I believe that private hospitals worked on these or similar lines would give general satisfaction both to the public and to the medical profession.

We now turn to the question of extern patients, but before doing so let us briefly review the provisions existing at present in Dublin, city and suburbs, for the outdoor medical relief of the poor. I would comprise in this table the North and South City, also Donnybrook, Rathmines, Clontarf and Howth, Coolock and Drumcondra, Finglas and Glasnevin, Palmerstown, Rathfarnham, Blackrock, Stillorgan, and Kingstown. This large district, from which the out-patients to the Dublin hospitals chiefly come, contains, according to the Census of 1891, a population of 356,240 persons. To what extent have they received medical aid gratuitously during a period of twelve months?

First, they have the poor law dispensaries, of which there are 27, officered by 30 doctors and 11 apothecaries, who, according to the last Report of the Local Government Board, attended 100,216 persons in one year. Then we have the hospitals—10 general hospitals and 14 special hospitals, in the out-patient departments, of which over 130,000 patients are annually treated, according to the return in Burdett's Hospital Annual, but the numbers are much larger, if we take the returns from the Reports as furnished by the different hospitals. The out-patients of a hospital may be classified under three headings:—

1. Accidents, treated as out-patients.
2. Midwifery cases, treated as out-patients.
3. Cases attending the hospital dispensaries.

Of the cases included under the first two headings accurate registers are kept, so that their numbers can be relied upon. The returns for the Dublin hospitals for the past year are:—

Accidents (extern) - - - -	30,695
Extern Midwifery cases (Rotunda, Coombe, Sir P. Dun's) - - - - -	4,574
Total, -	35,269

The dispensary cases amounted to the enormous total of 218,475. These figures cannot, of course, mean individuals, but must include the *entire number of attendances* of each patient. How, then, may we arrive approximately at the number of individual patients treated in the hospital dispensaries? This may be done, I think, in three different ways, all leading practically to the same conclusion:—

1. By actual figures. In the Report of the National Eye and Ear Infirmary for the present year, we see (p. 19) that the number of new patients was 2,918, and that the total number of visits paid by old and new patients was 18,740. This gives us practically *six attendances* for each patient.

2. In Burdett's Hospital Annual for 1893, p. xcviii., we have an estimate of the cost of out-patients at various classes of institutions; the cost for each out-patient in *general hospitals* in London, the provinces, Scotland and Ireland, he fixes at 1s. 6d. This again would give us about *six attendances*, if we allow the cost of medicine, &c., to be 3d. for each visit.

3. The class of cases that form the bulk of those seen at our general dispensaries are coughs and colds, sprains, disordered stomachs, &c., usually attending twice a week for about three weeks—that is, *six attendances*.

If, then, we divide the total number of attendances—viz., 218,475, by six, we get 36,412. This number, added to the accidents and midwifery cases before mentioned, gives a total of 71,681, which is probably very near the mark: and this last number, added to the total number of patients

(100,216) returned as receiving poor-law medical relief, gives a total of 171,897 persons (or 482 to each 1,000 of the entire population of the district) receiving medical aid gratuitously, and that, too, excluding the large numbers who are annually admitted as intern patients to the various hospitals.

It is difficult to estimate the number of those who might fairly be considered entitled to gratuitous reliefi n the extern departments of Dublin hospitals; but if we look into the returns of the Registrar-General for the Census of 1891 we find a classification which may help us. House accommodation is divided into four classes; the *fourth class* comprises the very poor, living in crowded tenement houses. This class contains, in round numbers, about 100,000 persons, in Dublin and its suburbs, and these are undoubted objects of charity. Their number corresponds very closely to the poor law returns just mentioned (viz., 100,216), and shows, at the same time, that liberal use is made of the privilege accorded to them.

Those occupying *third-class* accommodation in the better sort of tenement houses consist chiefly of artisans, most of whom are in "sick clubs" and "benefit societies," and cannot be regarded as paupers; at the same time they might fairly be permitted to avail themselves of the advantages offered in our hospital dispensaries, were they prepared to pay a small sum sufficient to prevent the charity being at a loss by them; and this, as a matter of fact, is the class which avails itself most largely of the out-patient departments attached to the Dublin hospitals.

To anyone making a tour of these dispensaries the following facts will be apparent:—

1st. The general air of respectability in the patients, the very poor class by no means predominating.

2nd. The invariable presence of a considerable percentage of persons who obviously should not be recipients of charity.

3rd. The very low percentage of serious or even interesting cases of disease presenting themselves for treatment.

4th. A number of familiar faces—old stagers—who spend their time aimlessly wandering from one dispensary to another, and when they are driven out of one, proceeding, as Mark Twain once put it, "to confer their disastrous patronage on some other firm." These may be frequently seen tasting each other's medicine, and making critical and sometimes uncomplimentary remarks upon the hospital and its staff.

The evils of this indiscriminate charity are obvious:—

In the first place, there is a direct pecuniary loss to the hospitals. It has been estimated that the cost of each out-patient is 1s. 6d., and when this sum has to be multiplied by thousands it becomes a very serious item in the annual expenditure. Let us illustrate this. Assuming the approximate number of 100,000 persons occupying fourth-class house accommodation to be a fair estimate of the absolutely poor who are entirely unable to pay anything for medical advice; if we subtract this number from the total of those receiving extern medical aid from the Poor Law and the Dublin hospitals combined—viz., 171,837—we have remaining over 71,897. If we take, again, from this number the 11,897, assuming that these persons pay something at the few hospital dispensaries that do make a small charge, we have still, in round numbers, 60,000 free patients remaining, who, at the rate of 1s. 6d. per head, cost the Dublin hospitals the large sum of £4,500 per annum.

The second evil of this indiscriminate charity is the injustice that is done doctors and students. Our hospitals are essentially educational institutions. Instruction in dispensary practice forms a most important part of a student's education; but teaching becomes impossible if the limited time at the doctor's disposal be taken up with a crowd of trivial

cases, such as form the bulk of those attending our dispensaries, and the work has to be rushed through in a perfunctory and unsatisfactory manner.

Thirdly, injustice is done to the benevolent public, who are paying twice over for the medical relief of the poor; not only through the rates, by which the poor-law dispensaries are supported, but also in subscriptions to hospitals for doing unnecessary and unprofitable work, for which ample provision has been made elsewhere. This wretched system must also have a debasing and demoralising effect upon the recipients of such charitable relief, nor can it be remedied until an accurate register is kept of the name, address, and occupation of each out-patient, in every general hospital, to be followed up, when necessary, by a rigid investigation into the circumstances of all doubtful cases; and further, all save the very poor should pay a small sum to defray the cost of medicine, &c. This plan is in operation in one of the leading general hospitals of Dublin, as well as in several of the special hospitals, and appears to work in a satisfactory manner.

I cannot expect for a moment that any poor words of mine are likely to revolutionise the management and administration of our great medical charities, but for a long time past I have felt it to be laid upon me as a duty to say out, however imperfectly, what I honestly believe regarding the abuse of the pay-patient system and of the out-patient system in our Dublin hospitals. It should not be possible that a country gentleman, with hunters in his stable, or that an officer in a cavalry regiment, should be permitted, for a nominal payment, to occupy a bed in a charitable institution, and to enjoy GRATUITOUSLY the services of its medical and surgical staff. It should not be possible for a lady to attend for several months the dispensary of a Dublin hospital, and the fraud—for I can call it by no other name—only to be

accidentally detected by a student, who happened to recognise, in the hospital patient, his hostess at a tennis party the previous week.

It would be easy to multiply instances of this kind, but it is needless to do so. The facts are notorious. The evil exists in every large city throughout the United Kingdom; and this being so, surely all right-minded people will join in reprobating the monstrous wrong that is done, by the abuses I have mentioned, to the members of an overworked and, as a rule, underpaid profession, by occupying their time and talents on objects undeserving of their charity; and also the injustice of diverting the contributions of the charitable and benevolent from their legitimate channels, to the encouragement of a shameless and fraudulent abuse of hospital charities on the part of the well-to-do, and to the countenancing of a chronic and unnecessary haunting of hospital dispensaries by the idle or hypochondriacal poor.

Dr. Grimshaw said that although everybody admitted the facts Dr. Tweedy had stated, it was very difficult to see how they were to be remedied. As to the in-patient abuse, people should not be taken into hospital as pay-patients unless, all their circumstances having been inquired into, it was found that they were in reduced straits. If patients fairly well-to-do come from the country, let them take lodgings and have a medical attendant. An institution such as exists in London, Berlin, and Vienna, and which resembles a medical hotel, in which each patient could have his own medical attendant, was very much needed in Dublin. It was very much more difficult to deal with the out-patient department because it was so hard to decide whether a person was deserving or not of advice.

Dr. Cox thought that one of the best ways to remedy this state of affairs was to give as much publicity as possible to Dr. Tweedy's paper. No doubt a great abuse existed. Frequently artisans earning £2 a week were admitted as patients into hospital Usually 30s. out of the £2 went in drink, and during the time of.

their stay in hospital the wife and children had to be supported by charity or out-door relief, which, in the event of the patient's death, became a permanent burden on the public. He also thought there should be more co-operation between the dispensary and hospital staffs. Very often dispensary doctors found it necessary to have patients sent to hospital on account of being unable to get proper treatment for them in their own miserable homes. Members of the hospital staff did not always keep this in mind.

Dr. Heard said that the plan adopted in Monkstown Hospital was found to answer very well. Admission to the hospital or the dispensary was by ticket. Tickets were given to subscribers at the rate of twelve for £1 1s. The subscribers distributed them to needy people with whom they were acquainted as necessity arose. A local doctor also could recommend a case to hospital, and if there was a vacancy the patient was admitted.

Dr. Doyle said that it was not the very poor who came to the general hospitals for relief—they went to the Union hospitals. The Poor Law institutions had been started to supply a want which now no longer existed as it was supplied by the general hospitals. He thought, therefore, that eventually the Poor Law institutions would have to be abolished.

Dr. W. J. Smyly said he thought that the in-patient abuse of hospitals by well-to-do people bore very heavily on specialists. Many of the so-called private hospitals at present existing in Dublin were nothing better than clean lodginghouses. No proper operating room existed in them. He also considered that doctors would have to co-operate against this hospital abuse. They should refuse to admit well-to-do patients into hospitals.

Dr. F. W. Kidd thought that the subject might be very fittingly brought forward at the next annual meeting of the Dublin Branch of the British Medical Association.

Dr. Tweedy briefly replied.

SECTION OF ANATOMY AND PHYSIOLOGY.

ON THE POSITION OF ANATOMY IN GENERAL, AND THE CENTRAL NERVOUS SYSTEM IN PARTICULAR, WITH LIME-LIGHT DEMONSTRATION OF ANATOMY FROM THE MORPHOLOGICAL SIDE (MACROSCOPIC, MINUTE, AND DEVELOPMENTAL).

By ALEC FRASER,

Professor of Anatomy, Royal College of Surgeons.

[Read in the Section of Anatomy and Physiology, January 26, 1894.]

The first half of this Address, of which the following is a summary, was called forth by the letters which appeared in *Nature*, October 26 and November 9, 1893, from Professor Ray Lankester, of Oxford. Coming from a man of his acknowledged standing and eminence, being, as he is, the most distinguished of the young school of English morphologists now remaining, and the matter they contained being from his point of view unfortunately too true, led me to contrast the position and the conditions under which the teachers of human anatomy in Germany and in the three divisions of our own country have to work. No one knows better than Professor Ray Lankester that matter of the same character could not be used by a professor, however eminent, in the philosophic or natural science faculty, in any German university, in reference to his scientific colleagues of the medical one, often quite as eminent as himself.

In doing so I had to enter into some detail in regard to the manner in which medical teaching was done in our own country—by universities, by colleges, and by private enterprise, the latter more especially in London, to some extent in Edinburgh and Glasgow, and also, up to a very recent date, here in Dublin. In Germany, on the other hand, all medical teaching was done by universities only, and by teachers appointed by the State. Comparable acquirements and results in the shape of morphological contributions to knowledge could only be looked for in our own country from those holding university positions, or similar ones in certain of the metropolitan or provincial colleges, who were in the fortunate position of having a certain amount of leisure apart from their teaching duties.

In order to appreciate or understand Professor Ray Lankester's position it was necessary to note the rise of the young school of English morphologists, due largely to the scientific insight and forethought of the distinguished Professor of Physiology in the University of Cambridge, who, associated with his famous pupil, the late Professor F. M. Balfour, created the great school of morphology in connection with that university, the Oxford side being represented by the late Professor Moseley, and now by Professor Ray Lankester.

The older representatives of English natural science were generally medical graduates. Professor Huxley, by far the most distinguished of those who remain, had such a training.

The young school, however, have little, if any, connection at all with medicine, and judge us and our work by the pure scientific standard, and it is in this sense that Professor Ray Lankester's judgment must be said to be true.

The human morphologist's vision must from its nature be always a more limited one than that of the comparative morphologist, and he must recognise that it takes a Darwin to write of the "Descent of Man," a Huxley to fix his "Place in Nature," a Haeckel to speak of his "Evolution," and a Weismann to raise controversy regarding the "Continuity of his Germ Plasm"—that these are men who have garnered in their minds all the knowledge of their time in respect to organic nature, who are able to formulate new conceptions, and to change the current of thought in almost every branch of knowledge.

The second half of the address was taken up by throwing on the screen examples of the manner in which my inward thought had endeavoured to make for itself outward expression during the preceding ten years. The screen pictures exhibited were from slides, reductions from my 15 × 12 inch negatives. Of the latter I had made nearly one thousand, exhibiting original observations on vertebrate morphology and embryology. More than half the number dealt with the anatomy of man in his infantile and adult stages; his external form in various positions and actions (from the living model), also his internal structure, with particular reference to his central nervous system.

The smaller half dealt with the embryology of the dogfish and salmon among fishes, with that of the frog and newt among amphibians, with the chick, duck, and canary among birds, and with that of the rabbit, rat, mouse, guinea-pig, hedgehog, mole, calf, sheep, pig, dog, cat, monkey (two examples), and man amongst mammals. My observations have thus covered all the divisions of the vertebrata except reptiles, the embryos of which I have hitherto been unable to obtain, except one of a rattlesnake.

I have not only photographed the external form of the

several examples mentioned under the different classes, but also the serial sections into which the embryos have been cut at a direct enlargement of from ten to twenty times, so that the whole internal form can be read from the prints taken from the negatives without the trouble of looking down the microscope. The prints can be made transparent, and the sections placed in order one over the other; reconstruction figures or even models can in this way be made with the greatest ease.

My observations have of necessity been much more complete in certain examples than in others. In the rat I have, both as regards external form and serial microscopic sections, a very complete series of specimens at intervals of four hours from the eighteenth hour after union of the sexes up to birth, which occurs at the end of the third week. In the human example I have also been able, by the kindness of many friends in Dublin and in various parts of Ireland and England, to make and work over an almost complete series of specimens, varying in length from less than 10 mm. up to birth.

In addition, I have photographed complete series of sections made in the sagittal, coronal, and horizontal directions of the adult brains of the cat, dog, seal, rabbit, monkey, and in man not only the adult, but also at birth and several intervening stages.

I had made 150 slides for the screen, selecting examples from all those stated in the preceding summary of my work. Time, however, prevented me from showing more than one hundred.

The Plates which accompany this summary I have had made in order to give readers an idea of those which were thrown on the screen.

As the number had to be limited I selected negatives for reproduction which dealt with the anatomy of human

fœtuses (Plates IV. and V.), or with that of the human embryo and lower mammal (Plate I.). Plates II. and III. were selected to show the aid which photography can give in the easy reading of serial sections, and of the many uses to which these can be applied.

All the Plates are reductions from 15 × 12 inch negatives, except, of course, the lithographic ones, which were made simply as explanatory of the preceding five.

EXPLANATION OF THE PLATES.

The first three Plates require to be studied or observed with the heading of each turned towards the right hand of the observer, and in my remarks in reference to these three I will take it for granted that the reader is so observing them.

The remaining plates are to be studied in the direction of the heading.

Plate I. represents mainly a series of rat embryos at different ages and from different aspects; there is in addition a very fine human embryo and a canary bird embryo.

The embryos are arranged in three rows, of which the lower is double towards the right hand. Of the four embryos which form the double part of this row, the two smaller are at 10 days 16 hours date after union of the sexes. The heart, and the cephalic and allantoic ends of the embryo can be noted. The medullary groove, except in the region of the mid-brain, is still in great part unclosed. The two larger are at 11 days 16 hours, at which date the various divisions of the encephalon can be recognised. Of the visceral arches, the mandibular is the most prominent, and the limbs are budding from the side of the trunk.

The remaining five embryos of this lower row and the two at the right hand of the second row are seven members of a family of rats at 12 days 16 hours. Four of

the seven show the lateral aspect, two the front aspect, and the remaining one (the last at the left hand of the lower row) the dorsal aspect, in particular the fossa rhomboidalis, the beginning cerebellum and the mid-brain.

In all of these embryos the several divisions of the central nervous system can be readily observed, the budding hemisphere brain, the thalamic and mid-brain, the isthmus, the two lateral plates which are to unite to form the cerebellum, and the great extent of the after brain or medulla—all are to be noted.

Of the three remaining embryos of the second row, the last one at the left hand is the front aspect of a canary embryo of about the sixth day. The other two and the two at the left hand of the upper row are four members of a family of rats at 13 days 16 hours. The two of the upper row show the lateral aspect and have the fœtal placenta attached; the two of the second row show the ventral and the dorsal aspects.

The remaining embryo at the right hand of the upper row is the finest human embryo at this stage in my possession. It is at the same stage of development as the rat embryo of 12 days 16 hours immediately underneath it in the second row.

The two can be compared and conclusions can be drawn by each man for himself, according to his leanings and the knowledge he possesses for forming an accurate judgment.

All the embryos on this plate are enlarged about three times. In Plate VI., Figs. 1 and 2, are enlargements of the human embryo and the rat embryo of 12 days 16 hours spoken of above. I have in these diagrams roughly marked in the various divisions of the central nervous system—the hemisphere brain, the thalamic and mid-brain, the isthmus (the depression between the mid-brain and cerebellum), the cerebellum, the medulla with its thin roof,

and the spinal cord. In connection with these can be seen the neck, pons, and cephalic flexures, the first of these being much better marked in the human than in the rat embryo.

The nasal groove, the eye, the ear, as well as the various visceral arches, the maxillary, the mandibular, the hyoid, and the first branchial, the second branchial being covered in; the heart, the liver, the fore and hind limbs, the umbilical cord, and the primitive segments in the trunk region are all to be noted.

Plate II. represents the sections under the cover-glass of one of my serial slides of a sheep embryo. They are enlarged about four times the size of nature, the direction in which the sections have been made through the head can be read from the long vertical section, Fig. 3 of Plate VI., by connecting the numeral 4 of 4th ventricle with the t. of the word striatum. The sections run in rows of six, the one most cephalad being at the right hand of the lower row, the last of the sections—that in the caudal direction—being at the left hand of the upper row.

The medulla is cut in the region of its greatest width, and the membranous roof is in two divisions. In the majority of the sections the tænia of the medulla has made its appearance. The cut thalamic and hemisphere brain lie cephalad of the head flexure.

I have marked in the names of the several noteworthy features of the sections in Fig. 7 of Plate VIII., which is an enlargement of one of them. Part of the epithelial lining of the dorsal half of the thin medullary roof of the 4th ventricle has disappeared, the first step perhaps in the formation of the foramen of Majendie. The inrolling of the hemisphere wall to form the striatum, the fusion of this with the subthalamic portion of the thalamic brain, the ending of the choroid plexus at the

bottom of the interpallial fissure, and its succession by the thickened part of the anterior wall of the thalamic brain, from which will arise the anterior pillars of the fornix and the callosum, the cavities of the third and lateral ventricles with the foramen of Munro, are all to be distinguished.

PLATE III. represents an enlargement about three and one-third the size of nature of the sections under the cover-glass of one of my slides, from a series of long vertical sections of the sheep. The sections are very oblique, so that the spinal cord is not shown, although all the divisions of the developing encephalon can be recognised. I have given an enlargement of the head portion of one of the sections—Fig. 8 of Plate VIII., with the names of the several divisions marked in. With this Fig. has to be associated Fig. 3 of Plate VI., which is an enlargement of a section from a long vertical series of a younger embryo, in which the cutting plane fell almost parallel with the median one of the embryo. The Fig. does not represent the exact median plane, but is a little to one side of it, cutting the wall of the embryonic spinal cord instead of the central canal, and showing the hemisphere outgrowths, which would not be shown had the section been exactly median. The infundibulum, the optic and mammillary recesses of the thalamic brain, the striate part of the hemisphere brain with the hypophysis from the primitive mouth cavity can all be noted. In Fig. 8 of Plate VIII. the anterior and posterior divisions of the central olfactory apparatus, the striatum, the third and lateral ventricles, the choroid plexus, the nasal, and the superior and inferior maxillary regions of the face, as well as the remaining structures, the names of which are given in full, are to be observed. In addition to the head end of the embryo in Plate III., the heart, the lungs, the curve formed

by the ribs, the liver, the intestinal tube, the Wölffian body, the genital eminence and tail are all shown.

Plate IV. represents a series of nine human fœtuses, with the brain and spinal cord of a tenth. They varied in length from 7½ cm. to 20 cm., natural size (head and trunk measurement, the head extended on the trunk, not flexed, as in the ordinary intra-uterine position). They are all reduced to about one-third the size of nature.

Four of the smaller ones, from 7½ to 11 cm. in length, have been cut along or near the median longitudinal plane, and the two halves lie adjacent to one another. All the four show the transitory fissures on the median surface of the hemisphere wall. The presence of these on this aspect is to be correlated with the fact that this part of the wall at this stage (before the appearance of the callosal fibres) is by far the thinnest portion.

The cranial aspect of the hemisphere wall in these four, and at much later stages in well-preserved specimens, is, in my experience, always smooth. It is so even after the callosal fibres have appeared, at which date the transitory fissures of the median aspect of the wall have disappeared, with one, or at the most, two exceptions. These transitory fissures are arranged radially along the median aspect, and run at intervals from its dorsal to its ventral border. They are eight in number in my specimens.

Of the remaining five fœtuses on the plate the hemisphere of the smaller one (in the second row) has been dissected to show the lateral ventricles from the front. The olfactory lobes at this stage are still hollow, and communicate freely with the ventricular cavity.

In the remaining four the callosal fibres have appeared. The largest of the four—that at the left upper border of the plate—shows the median aspect of the hemisphere brain, where the callosum, the parieto-occipital fissure, and

the beginning of the calcarine can be seen, as well as the lateral aspect of the mid- and hind-brain.

The remaining three show the dissections made to expose the ventricular aspect of the median wall of the hemisphere brain. In the largest of the three—the second at the left upper border of the plate—the striatum has been turned down by cutting the peduncle uniting it with the thalamus.

In the fœtus at the left lower border of the plate the striatum has been removed altogether, and is shown on the plate lying adjacent to the head.

Of the remaining fœtus the head only has been dissected, and appears by itself at the left hand of the second row.

The brain and cord shown by itself also on this row was placed in to show the calcarine fissure arising independently of the parieto-occipital, thus differing from its mode of origin in the fœtus at the left upper border of the plate. In order that the reader could follow more clearly the remarks made here, I have given in Plate VII. two diagrams—Figs. 5 and 6—of the two fœtuses at the left lower border of Plate IV., natural size, with the main features of structure marked in. Fig. 5 is after the appearance of the callosal fibres, Fig. 6 before their appearance.

In Fig. 5 the cranial aspect of the hemisphere wall was smooth, the striatum is simply turned down to show the cut peduncle (in this respect differing from the photograph in which it lies separate from the head). The choroid plexus was removed to show the choroid fissure. The septum pellucidum was completely absent, and the adjacent ventricles were thus thrown into free communication otherwise than by the foramina of Munro. The fornix, the hippocampus major and minor, the hollow olfactory lobe, the optic nerve, the divisions of the cephalic half of the

striatum, and the thickness of the hemisphere wall are all to be observed.

In Fig. 6 the transitory fissures are present on the median aspect of the hemisphere wall. The fissure separating the olfactory lobe from the adjacent hemisphere runs radially and serially with the others, but it is not transitory in character. Sufficient attention has not as yet been paid to this feature. The median aspect of the remaining divisions of the encephalon are also given in this Figure. The thalamic brain with its optic, infundibular, and epiphysial outgrowths, its thin roof, from the epiphysis to the foramen of Munro, as well as its anterior wall from the foramen of Munro to the optic recess, can be noted. In the dorsal half of this anterior wall arise the anterior, the fornix, and the callosal commisures, the true history of which has yet to be written. The mid-brain, the isthmus, the hind- and after-brain are also to be seen.

For purposes of comparison with Fig. 6, I have given a median section through the head of a fœtal dog (Fig. 4 of the same plate), and of a chick (Fig. 9 of Plate VIII.). The amount of hemisphere brain in all three can be noted with the respective olfactory outgrowths. The thalamic brain does not differ so markedly in the human and dog diagrams as in that of the chick, where the epiphysial outgrowth is very large and directed towards the front. The optic commissure is also very much larger in the chick than in either of the others. The mid-brain region of the dog is much more extensive than in the human, and it is not covered by the hemisphere brain. In the chick it is still more extensive than in the dog, but laterally its real extent is not shown in median section, this falling between its lateral outgrowths. The median section of the cerebellum is also much more extensive in the chick than in either of the mammalian diagrams.

The reader must understand in this comparison that the diagrams of the chick and dog are enlarged $3\frac{1}{3}$, whilst that of the human is natural size.

PLATE V. represents the lateral aspect of the central nervous system of two fœtuses, about 31 cm. in length natural size (head and trunk measurement), and supposed to be about the eighth month. They are reduced in the plate to about one-third the size of nature. They require little, if any, explanation, as the anatomy is clear. The central sulcus and the two central convolutions are easily made out on the cranial surface of the respective hemispheres. The various opercula do not as yet in either of them cover in the central lobe. The cephalad ends of the temporal lobes are still in some measure smooth. The features mentioned are common to the hemispheres of both fœtuses, but in the regions cephalad and caudad of the respective central convolutions a single description would not be applicable, this being more true for the caudad direction than the cephalad one.

In this plate and in Plate IV. a large amount of the visceral anatomy of the thoracic and abdominal cavities is shown. It is not my purpose in this short summary to enter into this at all, but attention may be drawn to one feature of interest in connection with the vertebral column. A glance at the various dissected fœtuses on Plate IV. will show that the curves in the neck and lumbar regions of the column depend to a large extent on the position of the head and the inferior extremity; by flexing or extending the one or the other, the bends in the neck and lumbar regions can be produced or made to disappear at pleasure.

PLATES VI., VII., and VIII.—I have already described the various figures on these plates in the course of my remarks regarding the preceding five. In regard to the lettering which appears upon them, I have abbreviated

the words in many instances, but I have always used the first and succeeding letters of the respective word in the abbreviations. I append a list of these:—

Hem. brain has been used for			Hemisphere brain.
Str.	,,	,,	Striatum.
Ant. olf.	,,	,,	Anterior olfactory.
Post. olf.	,,	,,	Posterior olfactory.
Olf.	,,	,,	Olfactory.
Chor. plex.	,,	,,	Choroid plexus.
Lat. vent.	,,	,,	Lateral ventricle.
For.	,,	,,	Fornix.
Hip. major	,,	,,	Hippocampus major.
H. min.	,,	,,	Hippocampus minor.
Ped.	,,	,,	Peduncle connecting thalamus with striatum.
P. b.	,,	,,	Pituitary body.
F. ch.	,,	,,	Choroid fissure.
O. n.	,,	,,	Optic nerve.
F. M.	,,	,,	Foramen of Munro.
Th. br.	,,	,,	Thalamic brain.
Co.	,,	,,	Optic commissure.
Opt. rec.	,,	,,	Optic recess.
Inf.	,,	,,	Infundibulum.
3rd vent.	,,	,,	Third ventricle.
M. B.	,,	,,	Mid brain.
Cr.	,,	,,	Crus.
Cr. flex.	,,	,,	Cranial flexure.
Med.	,,	,,	Medulla.
4th vent.	,,	,,	Fourth ventricle.
Cer.	,,	,,	Cerebellum.
Max.	,,	,,	Maxillary arch.
Man.	,,	,,	Mandibular arch.
1st br.	,,	,,	First branchial arch.
Sup. max.	,,	,,	Superior maxilla.
Inf. max.	,,	,,	Inferior maxilla.
Umb. cord	,,	,,	Umbilical cord.
Ali. canal	,,	,,	Alimentary canal.

CASE OF SINGLE UNILATERAL KIDNEY.

By H. C. TWEEDY, M.D. Dubl., F.R.C.P.;
Physician to Madam Steevens' Hospital, Dublin.

[Read in the Section of Anatomy and Physiology, January 16, 1894.]

The patient in whom this rare condition was found was a woman aged thirty, a widow, married thirteen years, and the mother of seven children. She was admitted to Steevens' Hospital on 27th July, 1893, suffering from symptoms of portal obstruction, the result of cirrhosis of the liver, and ultimately died of acute peritonitis on the 9th January, 1894.

At the autopsy the liver was found to be diminished in size, its capsule thickened, and the organ itself extensively cirrhosed. The portal vein and its tributaries were pervious and otherwise normal, as were also the gall-bladder and bile ducts. The spleen was enlarged, dark in colour, and its capsule thickened.

The left kidney was greatly enlarged, though free from disease. The corresponding artery and vein were larger than usual, but normal in position. A point of special interest was the peculiar condition of one renal vein, which for a little part of its course was divided into two and united again.

No trace of a kidney could be found on the right side, and a careful dissection revealed no renal vessels on the right side, nor was there any trace of a ureter found on this side.

The measurements of the left kidney were as follows:—

Length = 13·5 cm.
Greatest breadth = 8 c.m.
Breadth at the hilum = 7·5 cm.
Thickness = 3·7 c.m.
The supra-renal bodies were present on each side.

As Mr. MacDonald Brown has written so recently and so fully in the *Journal of Anatomy and Physiology*[a] on this remarkable condition, it is not necessary to say much in comment on this case, but the following points seem worthy of notice:—

1. The condition was evidently congenital. No trace could be found of a right renal artery or vein. There was also no ureter on the right side, and that belonging to the left kidney was single,[b] as well as being considerably wider in calibre than a normal ureter.

2. There were no indications during life that this condition was present, nor was the cause of death in any way connected with the absence of the right kidney.

3. In many of the cases described by English[c] and Continental[d] authors anatomical defects were found in other organs on the affected side. In this case none such were discoverable.

4. The patient was a female, in whom the condition is more rarely found; the proportion of males being, according to Roberts, almost four to one. The left kidney is also more commonly absent than the right.

By a coincidence, in one of the recorded cases (Gubbin's),[e] the patient, as in the present instance, suffered from cirrhosis of the liver, with accompanying ascites.

[a] Vol. XXVIII., p. 196.
[b] Cf. Roberts. Urinary Diseases. 1885.
[c] Cf. Greenfield. Path. Soc. Trans. Vol. XXVIII., p. 164. Ogston. Obst. Soc., Lond. Vol. XXI., p. 57.
[d] Cf. Guttmann. Archi. f. Pathologie. Berlin. Vol. XCII., pp. 187–191.
[e] Brit. Med. Jour. June, 1883. Pp. 115.

PROFESSOR CUNNINGHAM thought that the members of the Anatomical Section should feel greatly indebted to Dr. Tweedy for bringing this specimen before them. He had very little doubt that it was a *bona fide* absence of the kidney. This was an extremely rare condition, and on that account the interest in it was considerably heightened.

PROFESSOR BIRMINGHAM said that a point of special interest in the specimen was the peculiar condition of one renal vein, which for a little part of its course divided into two and united again.

PROFESSOR PURSER inquired whether the broad ligament of the uterus was examined on that side, or whether the remains of the Wolffian bodies were to be found.

PROFESSOR FRASER said that, in reference to the aperture in the renal vein, he remembered a somewhat similar arrangement of veins in the pelvis which formed a *rete mirabile.*

DR. TWEEDY explained that no special examination was made of the broad ligaments of the uterus, because at the time their attention was directed to looking for a special pathological condition.

ON THE LOBUS OLFACTORIUS IMPAR.

By ALEC FRASER,

Professor of Anatomy, Royal College of Surgeons in Ireland.

[Read in the Section of Anatomy and Physiology, January 26, 1894.]

MUCH interest has recently been aroused and a good deal of discussion has followed the publication of the first part of von Kupffer's (1) "Studies on the Development of the Head of the Craniota," in which he described the last connection between ectoderm and brain-tube as forming a neuropore situated at the anterior end of the dorsal wall of the tube—that after closure the evidence of the early presence of this neuropore was always to be found as a median, hollow, beak-like process of the tube. The ectoderm over it formed a thickened plate, and this plate and the beak-like process on gradual separation were connected by a cord.

The median ectodermal thickening he homologised with the olfactory pit or groove of the larval Amphioxus (named by von Kölliker), and with the single olfactory organ of the Monorhina. The median, hollow, beak-like process he named lobus olfactorius impar (a name already given by Langerhans to the similar median projection of the medullary tube in Amphioxus). The projection of the cavity of the ventricle into the lobus he named the recessus lobus olfactorius impar.

The cord mentioned as connecting the lobe with the median olfactory ectodermic plate he looked upon as a median olfactory nerve. This cord and plate rapidly disappeared during the development in embryos of the higher vertebrata, but it is otherwise with the lobus and

its recess, which can be readily recognised, even in the adult. Thus in the adult human brain the recess found dorsal to the anterior commissure between the two anterior pillars of the fornix, and in front of the ending of the median choroid plexus, and united fornix pillars, called recessus triangularis by Schwalbe, he considered to be the homologue of the recessus olfactorius impar. He also found the recess in the brains of other adult mammals.

Von Wijhe's previous observations on the embryos of birds agreed with those of von Kupffer in respect to the last point of connection between the brain-tube and ectoderm being always found between the lateral olfactory ectodermal plates, although he did not describe a median olfactory plate. This plate has, however, been noted by Miss Platt in Acanthias.

Rabl. Rückhard (2) also describes the recess and lobe in Selachians, and notes them as being present in Amphibia and Reptiles.

The views of His (3) are very different to those of von Kupffer. He recognises that von Kupffer has shown that the last part of the wall of the primitive ventricular cavity to lose its connection with the ectoderm is situated at the junction of its roof and anterior boundary, and that this has the form of a conical projection which remains for some time connected with the ectoderm by a cord. This projection is, however, considered by His as forming the dorsal sac of the lamina terminalis, and as having nothing to do with the olfactory function; he, therefore, calls it the angulus terminalis.

The olfactory lobes develop laterally from the lamina terminalis, and Kupffer founds his theory on the supposition that in the Cyclostoma, or Round-mouthed Animals, the neuropore runs to an unpaired olfactory organ. His claims to have shown that in these also the olfactory organ

is paired, and that what is called unpaired nasal cavity (from which they derive the name of Monorhina, or single-nostril animals) is not this in a morphological sense at all.

His describes the brain-tube as having not only a dorsal suture but also a frontal closing line, the latter extending from the infundibular recess to the angulus. That the neuropore, in His's sense, includes the whole of the lamina from the optic recess to the angulus, while in the sense of von Kupffer it includes only the angulus. He claims to have demonstrated this frontal closing line in selachians and in the rabbit.

Burckhardt (4) agrees with His that the conical projection has nothing to do with the olfactory function, and that it is formed by a recess of the ventricle, which he calls recessus interolfactorius, or recessus neuroporicus, and that there is a lamina supra-neuroporica between it and the paraphysis or anterior epiphysis of the roof of the thalamic brain.

As far as my own observations go I have long been familiar with the projection in the embryos of the dog-fish, bird, and mammal, but I am not as yet prepared to give a definite opinion as to it being a terminally situated sensory organ in the sense of von Kupffer, although this writer's opinion is a very suggestive one, or whether it has no claim to such a morphological status in the sense of His.

REFERENCES.

(1) C. von Kupffer:—
Studien zur vergleichenden Entwicklungsgeschichte des Kopfes, der Kranioten.
1st Heft. Die Entwicklung des Kopfes von Acipenser Sturio. Leipzig and Munich, 1893.
2nd Heft. Die Entwicklung des Kopfes von Ammocoetes Planeri. Leipzig and Munich, 1894.

(2) H. Rabl. Rückhard:—
1. Der Lobus Olfactorius Impar der Selachier. Anat. Anzeiger, Sept. 1893. Nos. 21 and 22.
2. Das Vorderhirn der Kranioten. Anat. Anzeiger. No. 17. June, 1894.

(3) His:—

1. Ueber das frontale Ende und über die natürliche Einteilung des Gehirnröhres. Verhandl der Anatom. Gesellschaft auf der siebenten Versammlung in Göttingen, May, 1893.
2. Ueber das frontale Ende der Gehirnrohres. Archiv. für Anat. and Physiol. Anat. Abtheilung. III. and IV. Heft, S. 157, Leipzig, 1893, and Vorschläge zur Eintheilung des Gehirns, S. 172 of same number.
3. Zur Allgemeinen Morphologie des Gehirns. Archiv. für Anat. and Physiol. Anat. Abtheilung. V. and VI. Heft. 1892. S. 346.
4. Die Entwicklung der Menschlichen und Thierischer Physiognomien, same number. S. 384.

(4) Rudolf Burckhardt:—

1. Die Homologieen des Zwischenhirndaches und ihre Bedentung für die Morphologie des Hirns bei niederen Vertebraten. Anat. Anzeiger, Dec., 1893. Nos. 5 and 6.
2. Die Homologieen des Zwischenhirndaches bei Reptilien und Vögeln. Anat. Anzeiger, Feb., 1894. No. 10.
3. Zur Vergleichenden Anatomie des Vorderhirns bei Fischen. Anat. Anzeiger, April, 1894. No. 12.
4. Ueber den Bauplan des Gehirns. Verhand. der Anat. Gesells. auf der achten Versamm, in Strassburg. May, 1894.

(5) Studnicka:—

Zur Lösungeiniger Fragen aus der Morphologie des Vorderhirnes der Kranioten. Anat. Anzeiger, Feb., 1894. No. 10.

(6) Sorenson:—

1. The Pineal and Parietal Organ in Phrynosoma Coronata.
2. The Roof of the Diencephalon. Journal of Comparative Neurology, June, 1893.
3. Comparative Study of the Epiphysis and Roof of the Diencephalon. Journal of Comparative Neurology, April and September, 1894.

Professor Haddon explained that in some lower forms the only opening to the alimentary canal was through the anterior part of the nervous system, and this might account for the little recess. Professor Fraser had referred to the condition in the lamprey, but that species was rather a group in itself and off the main line, and little could be deduced from its condition. In conclusion, he failed to see what the neural canal had to do with the olfactory organ.

Professor Symington said that the olfactory part of the brain has lately attracted great interest. He thought, however, they needed some further proof that the part described by Prof. Fraser

was in communication with the olfactory bulbs. In the adult brain it appears to have a slight communication with the olfactory bulbs, but he would like very much to know if Professor Fraser could show them the degree of communication between this recess and the olfactory bulbs, either in man or the higher mammals. He did not quite grasp this relation to the olfactory bulbs, and he did not yet quite realise the grounds upon which Professor Fraser had come to this conclusion.

Professor Fraser said he did not think it was a greater jump to conclude that the little recessus triangularis was the recess of an ancestral median olfactory lobe than the conclusion about the median eye. There was a median thickening of the ectoderm corresponding to the small hollow projection from the median aspect of the brain, just as there was a lateral thickening of the ectoderm corresponding to the lateral olfactory lobes. In his opinion it was a very erroneous and unscientific way to judge of the importance of a structure from the adult condition in which it was found.

ON VARIOUS SINGLE AND DOUBLE MONSTROSITIES, WITH REMARKS ON ANENCEPHALIC AND AMYELIC NERVOUS SYSTEMS.

By ALEC FRASER,

Professor of Anatomy, Royal College of Surgeons in Ireland.

[Read in the Section of Anatomy and Physiology, May 25, 1894.]

THE impetus which led me to make the observations recorded here was obtained by the arrival of two living fowls with supernumerary legs, one kindly forwarded and presented to me by Mr. Russel, of Limerick, and the other by Dr. Friele, of Waterford.

Professor Cleland (1) has dealt with these abnormalities in so clear and masterly a manner that little remains for me to do except to corroborate. In the Limerick fowl the pelvic element of the supernumerary limbs lay to the right of the tail. The femoral element was single, and the muscles in some measure developed; between the single femoral element and the pelvic remains a slightly movable joint existed. The tibial element was single above and bifurcated below, the bifurcation ending in two well-developed feet, the one being the left foot of a right pelvis, and the other the right foot of a left pelvis.

Visceral duplicity was marked by the presence of three cæca. There was only one cloaca, with a single external aperture. My examination has not as yet extended so far as to say whether there was any evidence of spinal cord duplicity present.

In the Waterford fowl there was no pelvic or upper femoral element present; the single lower femoral element hung from the perineum. There were two tibiæ, ending

in two well-formed feet, which, as in the former, belonged to the adjacent sides of two pelves.

Visceral duplicity was again made evident by the presence of three cæca, and the single cloaca had two external apertures, which opened, one on either side of the single femoral element of the supernumerary limbs.

Through the kindness of many friends in Dublin, more especially the Master of the Coombe Hospital, I have been able to collect a considerable number of various forms of single and double human monsters at various ages, a large number of these being anencephalic; a smaller number being, in addition, amyelic.

A peripheral nervous system was found in all the specimens, with well-developed ganglia on the posterior roots. What struck me in particular was the presence of a fully-developed striated muscular system in all the specimens, in the absence of the ventral cell in the central nervous system, as it was a well-established fact that alteration in the ventral cells of the fully-formed cord led to atrophy of the muscles, especially in children, thus showing that the *rôle* of the ventral cell in the embryonic cord must be a very different one to that generally attributed to it in the fully-formed cord. It must not be forgotten, however, that the embryonic or fœtal muscular system has little opportunity to display its functional capacity, and that the trophic *rôle* of the cell may not be established.

I dissected carefully the reddish mass lying on the cranial base, called the substantia-medullo-vasculosa of Recklinghausen, and had found evidence therein of the early formation of the brain—in short, the central nervous system in all the specimens had been developed at an early period, until a date, at least, after the formation of the sensory ganglia from the medullary ridge and adjacent ectoderm; then development had ceased in the central

nervous tube from some pathological cause. There was clear evidence that the development of the peripheral nervous system once started from the closing lips of the central tube can go on quite independent of it, as was shown by its presence in a well-developed condition in all my specimens, and this in the absence of both brain and cord.

The full significance of these facts for the independence of the peripheral nervous system, after a certain stage, and for the presence of fully-developed muscular and other systems, has not as yet been fully appreciated.

REFERENCES.

(1) Prof. Cleland. Memoirs and Memoranda in Anatomy, Vol. I.:—
1. On Birds with Supernumerary Legs, and on Abcaudal Fission and Acephalus, with Biological Reflections.
2. Teratology, speculative and casual, and the classification of anomalies,

(2) Leonowa, O. v.:—
1. Ein Fall von Anencephalie. Archiv. f. Anat. und Phys. Anat. Abth., p. 403, 1890.
2. Contribution à l'étude de l'évolution pathologique du système nerveux, anencephalie totale combinée avec une Amyelie et un rachischisis totaux chez un Embryon humain, Bull. de la Soc. Impériale des Naturalistes de Moscou, 1893, Nos. 2 and 3.

(3) Darvas. Ueber das Nervensystem eines Anencephalus verglichen mit dem Nervensystem normaler Neugeborener. Verhand. der Anat. Gesells. auf der achten Versamm. in Strassburg, 1894.

(4) Wiedemann, Dr. J. Ueber die Enstehung der Doppelbildungen. Virchow's Archiv., Band. 138, Heft. I., p. 161.

A CASE OF COMPLETE TRANSPOSITION OF THE THORACIC AND ABDOMINAL VISCERA.

By ALEC FRASER,

Professor of Anatomy, Royal College of Surgeons in Ireland.

[Read in the Section of Anatomy and Physiology, May 25, 1894.]

The specimen exhibited at the meeting and recorded here was obtained in the dissecting room during the course of the Winter Session, 1893-94. It occurred in a female subject about forty-five years, of low stature, height only 4 ft. 2 in. I could not obtain any details as to the personal history. The condition must be a very rare one, as my personal experience has now extended over at least 1,400 subjects, and this is the first example I have met with.

The transposition is complete, not only in regard to the viscera of both thorax and abdomen but also to the blood-vessels and the thoracic duct.

In regard to the cause of such transpositions the most plausible theory would be to consider the female subject as having been one of twins developed from a single egg and in one set of membranes, dichotomy being complete, to support which I exhibit a double monster in which dichotomy is complete except in the thoracic region (thoracopagus), and in which the right of the two fœtuses has transposition of the viscera—a fact already noted by Förster (Missbildungen des Menschen. Jena. 1865. P. 136). This same fact had been suggested by Mr. Morrant Baker to Mr. Bland Sutton, as stated in his work on Evolution and Disease. London. 1890. P. 132.

This is not the explanation given by the great embryologist, von Baer, who, on rare occasions finding the embryo with its right side directed towards the yolk instead of the left as was

usual, considered this to be the cause of transposition of the viscera.

The number of cases recorded of genuine congenital transposition of the organs of both cavities, thorax and abdomen, are not numerous, and this number has been vitiated by including under the heading cases of transposition of the thoracic and abdominal viscera occurring separately, but even including these wrongly so recorded, the entire number would not reach two hundred. In the references which I have appended the 1st, 2nd, and 5th will enable any reader interested to reach the source of cases on record up to their respective dates. The 6th and 7th are cases recorded during the last year.

REFERENCES.

(1) Wenzel Gruber—Archiv. für Anat. und Physiologie. 1865. He gives a list of 79 cases.

(2) Scheele—Berliner klin, Wochenschrift, 1875, No. 30, p. 419—added a list of fourteen cases.

(3) Burgl.—Inaug. Diss. München, 1876, zur Casuistik des Situs Viscerum Mutatus—adds four cases and deals with previous ones.

(4) Potamianos—Inaug. Diss., Berlin, 1879—adds three cases, and contains Gruber's catalogue.

(5) G. J. Fisher—Vol. VII., Buck's Ref. Handbook of the Med. Sciences, p. 241, 1889—refers to the cases in English Literature chiefly, and directs attention to the foreign ones, and to the manner in which complete and incomplete cases have been mixed.

(6) Wartlin—A case of Situs Viscerum Inversus. New York Med. Jour., V. LIX., p. 306.

(7) Herrick, Henry J.—A case of Transposition of the Viscera. Med. Record, New York, V. XLVI., N. 4, p. 108.

DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

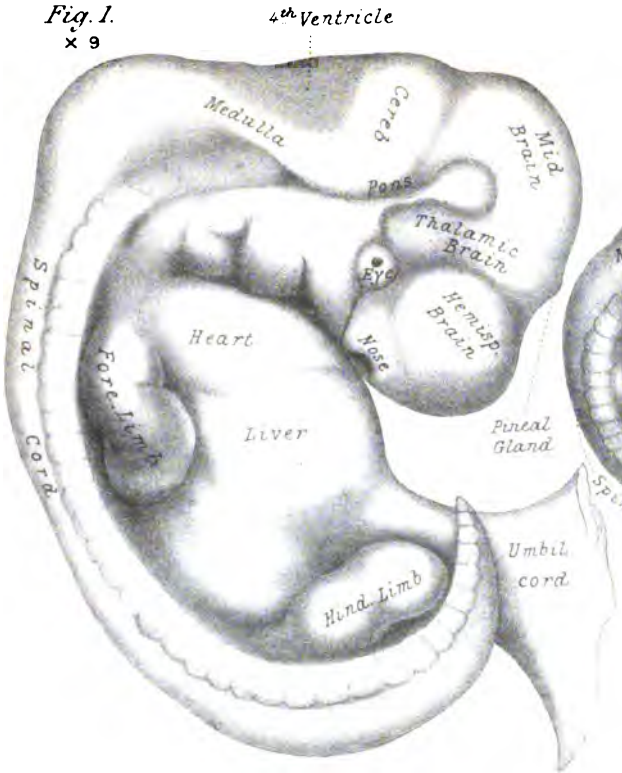
DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

DR. ALEC. FRASER

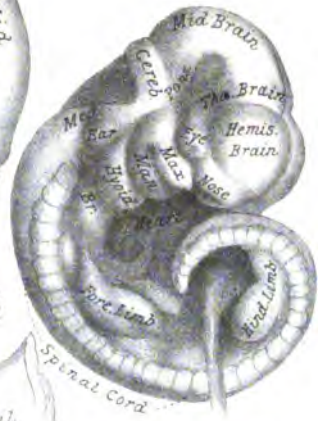
ON THE CENTRAL NERVOUS SYSTEM.

Fig. 1.
× 9



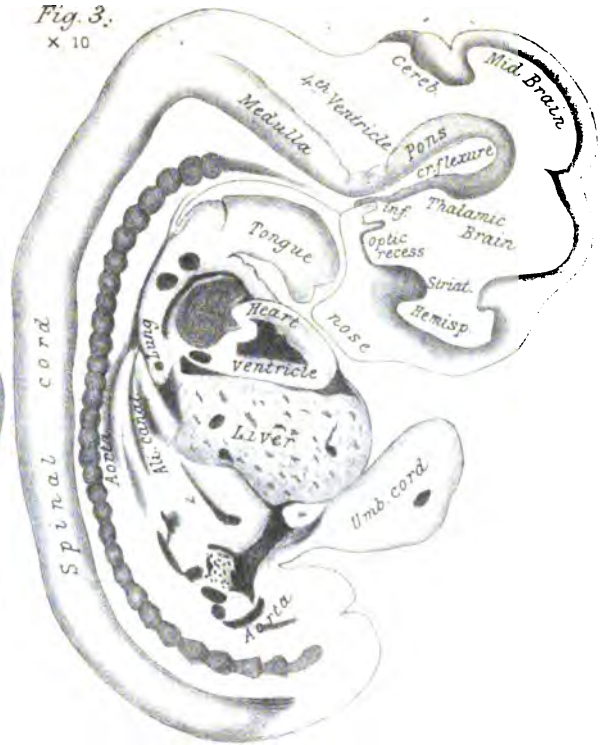
Human Embryo.

Fig. 2.
× 9



Rat Embryo
12 days 16 hours.

Fig. 3.
× 10



Sheep Embryo.

DR FRASER ON THE CENTRAL NERVOUS SYSTEM.

F Huth Lith. Edin.

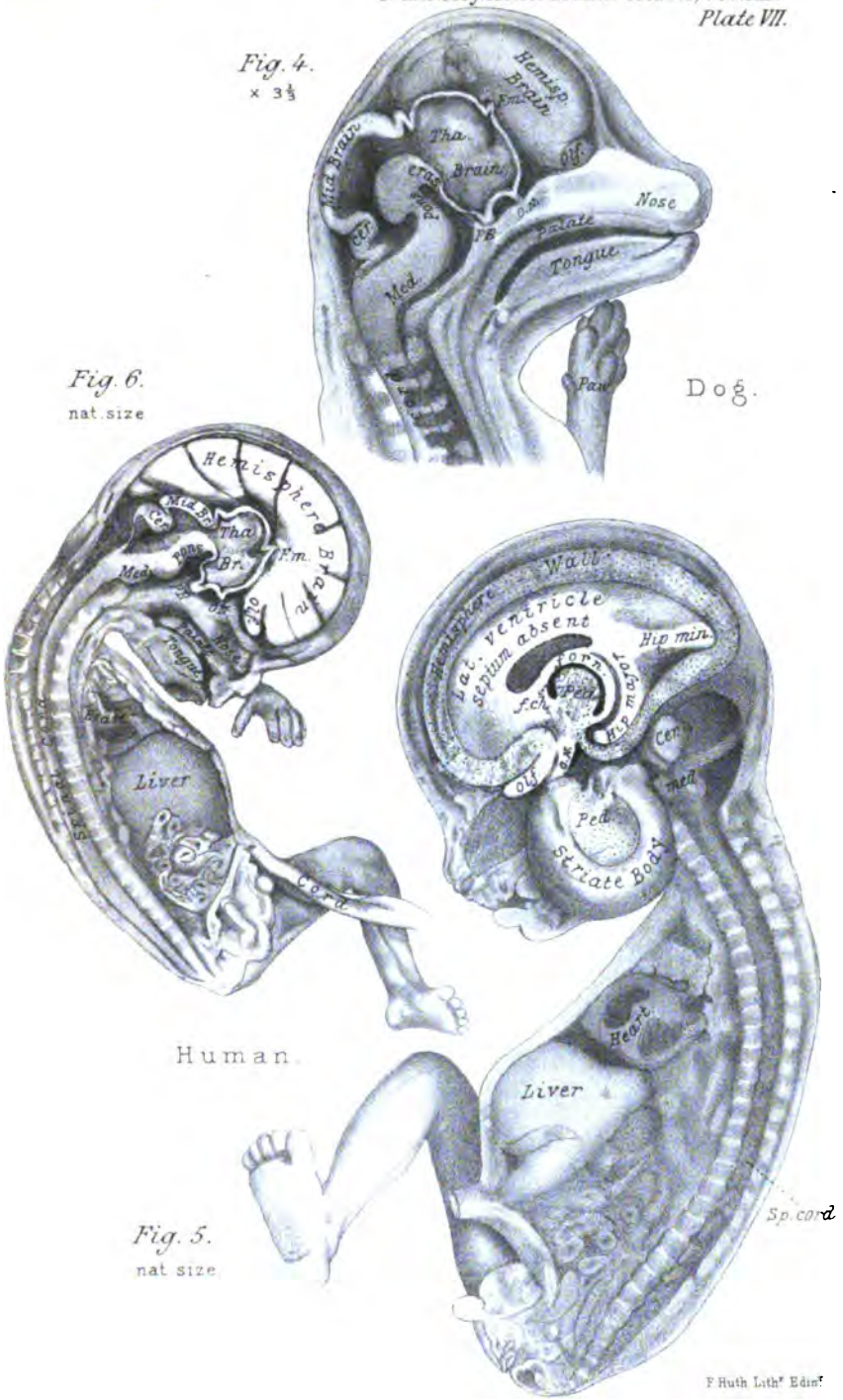
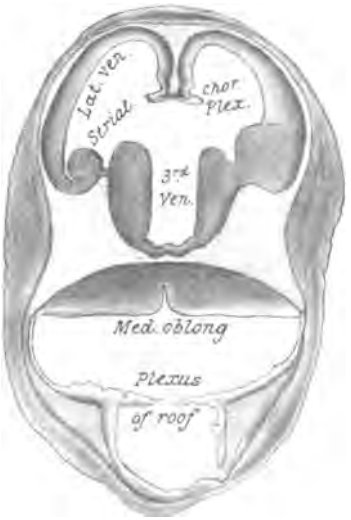


Fig. 4.
× 3⅓
Hemisp. Brain
Tha.
Brain
Mid. Brain
Olf.
Nose
Palate
Tongue
Med.
Paw
Dog.
Fig. 6.
nat. size
Hemisphere Brain
Tha.
Br.
Fm.
Med.
Liver
Cord
Human.
Wall
Lat. ventricle
Septum absent
Hip min.
Hip maj.
Cer.
Med.
Ped.
Striate Body
Heart
Liver
Sp. cord
Fig. 5.
nat. size
F. Huth Lith. Edin.

Fig. 7.
× 10

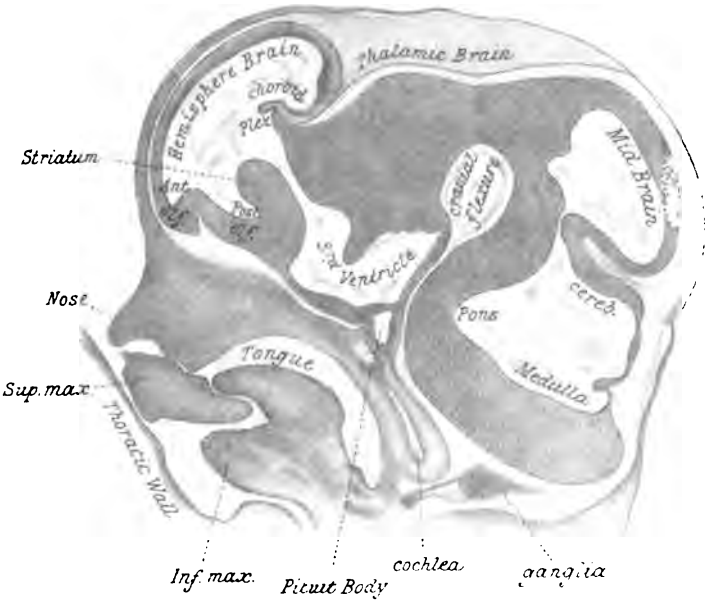


Sheep.

Fig. 9.
× 3½

Chick.

Fig. 8.
× 10



Sheep.

P. Huth, Lith. Edin.

DR FRASER ON THE CENTRAL NERVOUS SYSTEM.

THE MUSCLES OF THE EXTERNAL EAR.

By AMBROSE BIRMINGHAM, M.D.;

Professor of Anatomy, Catholic University.

[Read in the Section of Anatomy and Physiology, May 25, 1894.]

PRELIMINARY REPORT.

For some little time past I have been engaged in the study of the muscles of the external ear. So far I have examined but a small part of the material collected with this object, and the following remarks are to be looked upon merely as an *interim* report, which I hope to supplement largely in the coming year. Perhaps, indeed, I should protect myself by adding that as the work proceeds I may find it necessary to modify or completely change some of the views expressed in this communication. I shall also hold over an account of the literature of the subject until the final report is ready.

So far my work has been confined chiefly or almost entirely to man, but to clear up many points of interest it will be necessary to have recourse freely to an examination of the lower animals.

I have tried to approach the study of these muscles without prejudice or strongly-conceived ideas as to their arrangement, and with this object I put off the examination of the literature of the subject until I had advanced some distance in the study of my specimens.

It will be convenient to state here the chief points sought to be established in this communication:—

1. That the tendinous band which lies on the superior

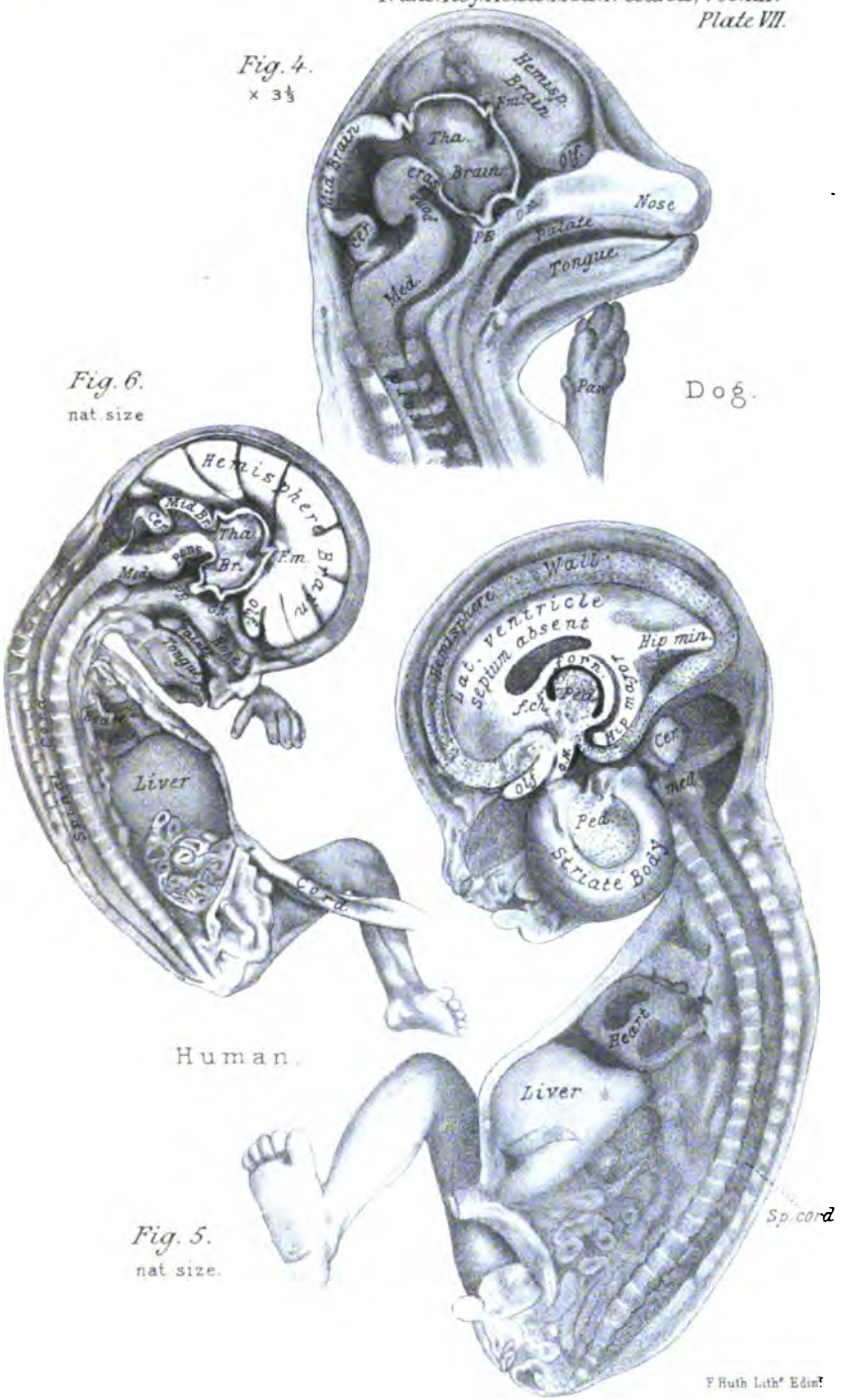


Fig. 4.
× 3⅓
Hemisp. Brain
Tha.
Brain
Mid. Brain
Olf.
Nose
Palate
Tongue
Med.
Dog.
Fig. 6.
nat. size
Hemisphere Brain
Tha.
Br.
Med.
Tongue
Heart
Liver
Cord
Human.
Wall
Hemisphere
Lat. ventricle
septum absent
Hip min
Hip maj
Cer
Olf.
Ped.
Striate Body
Heart
Liver
Sp. cord
Fig. 5.
nat. size.
F. Huth Lith. Edin.

DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

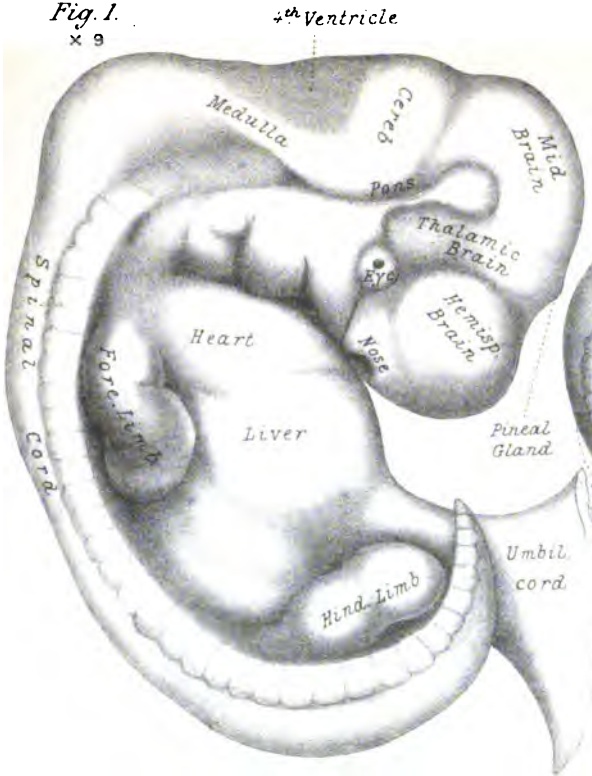
DR. ALEC. FRASER

ON THE CENTRAL NERVOUS SYSTEM.

DR. ALEC. FRASER

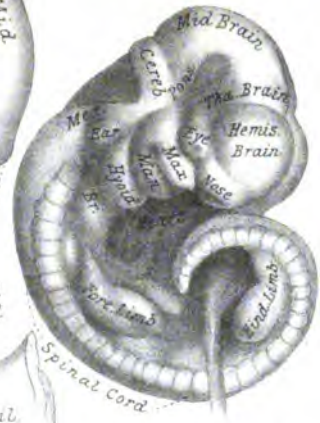
ON THE CENTRAL NERVOUS SYSTEM.

Fig. 1.
× 9



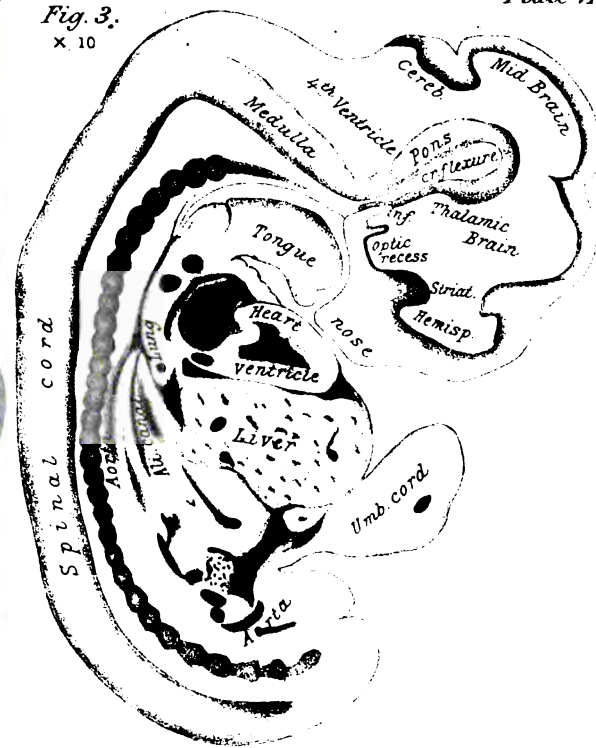
Human Embryo.

Fig. 2.
× 9



Rat Embryo
12 days 16 hours.

Fig. 3.
× 10

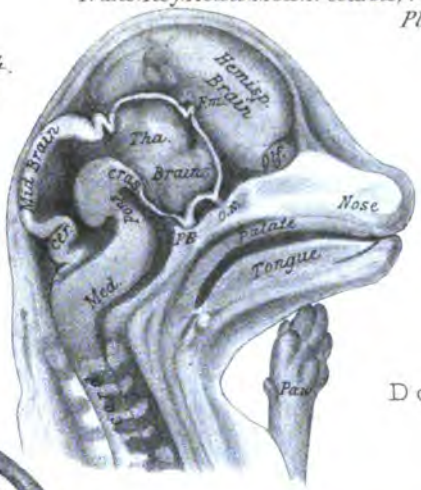


Sheep Embryo.

DR FRASER ON THE CENTRAL NERVOUS SYSTEM.

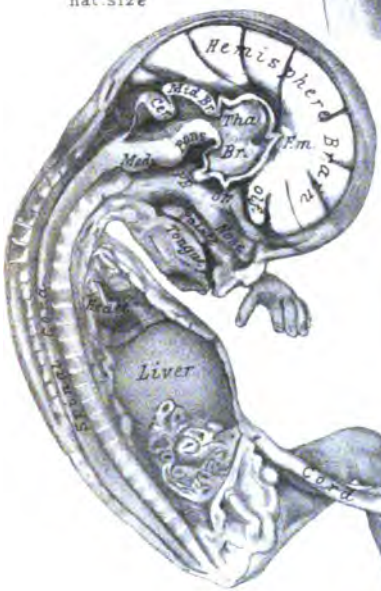
F Huth Lith. Edin.

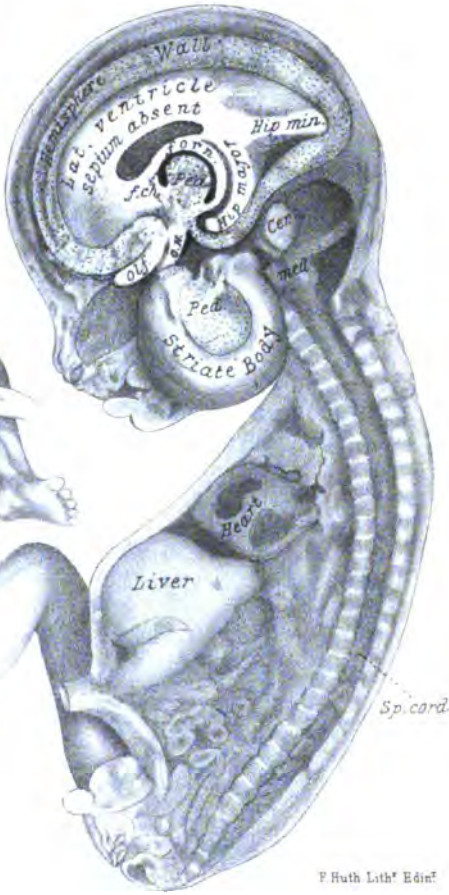
Fig. 4.
× 3⅔



Dog.

Fig. 6.
nat. size





Human.

Fig. 5.
nat. size

F. Huth Lith. Edin.

from the deep surface, it can be shown that the epicranial aponeurosis lies under the attollens.

The insertion of the attollens as usually given is very vague, and, I should add, inaccurate. We are told, as a rule, simply that it is inserted into the upper part of the deep surface of the pinna. This is incomplete. The full insertion is as follows:—The anterior fibres are inserted into the outer surface of the helix, and into the anterior margin of that structure (Fig. 3 C); the posterior half of the muscle is inserted into the deep surface of the fossa triangularis (or fossa of the antihelix) of the pinna, which on this surface is represented by a convexity (the eminentia fossæ triangularis of Schwalbe). Between the two insertions is a part in which the muscular fibres are few or absent, their place being taken by connective tissue; at this point an over-careful dissection may remove the connective tissue, when the muscle near its insertion will be divided into two parts—a condition described as the normal by Henle. Before I read Henle's account I too thought that the muscle was here divisible into two, and I even thought that the anterior part overlapped the posterior higher up, but subsequent and more cautious dissections incline me to the belief that a division is artificial. The portion of the attollens inserted into the helix is attached along a line, beginning about the middle of the outer surface of the helix, a little above the level of its spine; from this the attachment runs nearly vertically upwards and turns over the anterior margin, about the level of the upper part of the fossa triangularis (Fig. 3), while the posterior fibres of the muscle, which are separated from those just described, either by scattered muscular fibres or by connective tissue, gain insertion into the deep surface of the fossa triangularis. It will be observed, then, that the attollens is attached partly to the outer and partly to the deep surface of the pinna, the lower part of the muscle being split, as it were, by the

projection into it of the pinna. Sometimes a few of the most anterior fibres are inserted at a distance from the rest close to or at the base of the spine of the helix. Of this portion of the muscle I shall now have to speak more fully.

Debierre, in his "Anatomy," refers to the difficulty of making out with certainty the attrahens auriculam, which, he says, has been usually described as continuous with the anterior part of the attollens, but, he adds, it will be found that the attrahens is always separated from the attollens by the temporal vein. It is true, as a rule, that the anterior part of the attollens is more or less distinctly separated off from the rest of the muscle (Fig. 3 B, Fig. 1 E) by the posterior branch of the superficial temporal vein (Fig. 3 V), which (tracing upwards) comes through and becomes superficial here, while the corresponding artery runs up under the anterior part—often the mere edge—of the attollens. Besides, this small division of the attollens is generally inserted at some little distance from the rest of the muscle, approaching nearer to, and sometimes reaching the base of, the spine of the helix, while at its origin it is shorter than the fibres of the attollens, not reaching so far up on the side of the head. This division of the attollens just described does, especially in some subjects, look like an independent muscle, and one can well understand that it might be dissected and described as the attrahens.

Attrahens Auriculam or Auricularis anterior.—There is not a correct description of this muscle in any text-book with which I am acquainted. The want of a proper account of the muscle is felt most keenly by dissectors. I fear few students, following with the greatest care and skill the directions given for finding it in any of our practical anatomies, would succeed in displaying the true attrahens. The universal description is that the attrahens will be found quite superficial in the superficial fascia at the anterior border

of the attollens, with which muscle it is frequently continuous. Now this description is inaccurate, in that the attrahens does not lie superficial; it is not on the same plane as the attollens, but at a much deeper level, and it never is continuous with that muscle, but may be partly overlapped by it, and is always separated by a considerable interval in depth from the attollens.

As is well known, the attollens lies immediately under the skin, separated only by a thin layer of superficial fascia, and the posterior branch of the superficial temporal artery runs upwards, at first a short distance in front of the ear, and then passes onwards towards the vertex under cover of the anterior part of the attollens (Fig. 1 R). If in front of the ear, immediately above the level of the spine of the helix (or the point at which the crust of the helix springs from the bottom of the concha), the skin be reflected forwards, the removal of some superficial fascia will display the temporal artery (posterior branch), and perhaps the anterior edge of the attollens crossing it higher up. If, then, the temporal artery be drawn forwards, and the whitish fascia which lies under it removed in a line forwards and upwards from the spine of the helix, there will be seen a distinct, well-defined, and comparatively well-developed muscle (Fig. 1 C and Fig. 3 E) of a reddish colour—much redder than the attollens—which will probably measure about $\frac{3}{4}$ to 1 inch in length, and $\frac{1}{4}$ to $\frac{1}{3}$ of an inch in width. This muscle, which appears to be lying almost directly on the temporal fascia, is the attrahens. I have never found it absent, and it is never difficult to display.

As to the appearance of the muscle displayed in the manner explained above.—In shape it is a modified fan, the upper or anterior end being about twice as wide as the part attached to the ear. In position it lies well above the level of the zygoma, the part near the ear being about one-third

of an inch above that bony arch. Its long axis runs from the upper part of the spine of the helix towards the frontal eminence, or a higher point. Its depth from the surface, as mentioned above, is much greater than that of the attollens; they are separated in the line of the temporal artery by the thickness of that trunk, and nearer the ear by the thickness of the anterior border of the helix (Fig. 3); for, as will be seen, the attrahens is inserted chiefly on the deep surface of the pinna, while the adjacent part of the attollens—that is the anterior portion—is attached to its outer surface, consequently the pinna lies between the two muscles close to their insertion, separating them, and showing at once the depth of each.

Origin.—In many heads the muscle seems to arise from a layer of fascia which lies over the temporal aponeurosis, and the muscular fibres cease above along a curved convex border; beyond this they are replaced by a thin tendinous layer, which, after continuing the direction of the muscle for a very little way, seems to spread out and blend with or spring from the underlying fascia, and the muscle can be followed no further. In other heads the little tendinous layer described above is perhaps followed by a very thin muscular stratum, which grows indefinite further onwards. In the most favourable subjects (Fig. 1) the muscle can be traced into connection with the outer edge of the upper portion of the frontalis—in this wise: if the fascia be carefully removed from the upper and outer part of the frontalis, near where it passes into the epicranial aponeurosis, there will be found an extremely thin layer of muscular fibres coming off from the frontalis, and curving with a distinct bend backwards and downwards towards the ear (Fig. 1 B), the whole arrangement producing an appearance as if what was originally the outer margin of the frontalis were seized at its lower part and drawn backwards towards the top of the ear. This thin layer of muscle

is continued, with more or less tendinous intermixture, into the attrahens muscle; its upper or posterior margin grows thinner and is lost in the region of the attollens, while its lower border is continued as a membranous layer down over the zygoma into the parotid fascia.

Insertion.—The insertion of the muscle is not quite so simple as it looks at first sight. The first impression is that it is simply inserted into the deep surface of the spine of the helix. On more careful dissection it will be found that while the anterior fibres are inserted into the deep surface of the spine, the remaining fibres forming the greater part of the muscle are inserted into the deep surface of the concha, the line of attachment running back from the spine of the helix extends on the concha across the top of the meatus, and sometimes even curves down behind it for a variable distance. The fibres which are continued furthest back on the concha, and even down behind the meatus (as it were partly encircling the meatus), are those which form the upper and posterior part of the attrahens, and they are so disposed that, if their strength and the mobility of the pinna were great enough, on their contracting the point or top of the ear would be drawn forwards—a movement with which we are well acquainted in the lower animals.

Briefly, then, I would describe the attrahens as a small flat muscle of a distinct red colour, and of a narrow fan-shape, which will be found lying beneath the temporal artery in front of the ear, and a short distance above the zygoma, running in a line from the spine of the helix to the frontal eminence. It is most easily exposed by drawing forward the temporal artery and going through the underlying fascia in the line of the muscle. It seems to arise by a curved margin from a layer of fascia which lies over the temporal aponeurosis about ¾-inch in front of the ear, and here its muscular fibres end abruptly; but, in certain cases,

the muscle may be traced through the medium of scattered tendinous and thin muscular fibres into connection with the upper and outer part of the frontalis. The insertion is into the deep surface of the spine of the helix, and into the concha behind this, running backwards above the meatus for a variable distance. The insertion into the concha is the chief attachment.

Probably the most notable point about the attrahens as an ear muscle is the considerable depth at which it lies.

Parotido-Auricularis.—This is an occasional muscle which I found present three times in twelve specimens. It is slightly developed, being always pale and extremely thin; in length it measures nearly an inch, in breadth at its origin about ⅓-inch, and it rapidly narrows to a pointed insertion (Fig. 3 P). It springs from the fascia over the parotid gland, and running backwards and upwards it gains insertion into the lower part of the deep surface of the concha, in about the line of the anterior border of the antitragus. It is generally present in the lower animals.

Helicis Major.—I do not know why this muscle is described as an intrinsic muscle of the ear. I have never seen it confined to the ear alone. One end certainly is distinctly fixed to the ear, the other passes on to the side of the head into connection with the attollens. When carefully dissected, the helicis major looks much more like a degenerated extrinsic muscle, or a derivative of the attollens, than an intrinsic muscle of the pinna (Fig. 3 G).

The muscle is (as usually described) attached below by a pointed extremity to the apex of the spine of the helix (Fig. 3 W). It runs upwards, lying entirely in front of the pinna—not on the helix as we usually see it in illustrations—and, passing rather obliquely across the anterior part of the attollens, it ends about the level of the upper margin of the pinna, or higher up, in the fascia over the attollens, or

by blending with the fibres of the muscle itself (Fig. 3 G). Indeed, in one specimen examined, the helicis major appeared decidedly to be a derivative of the attollens. Some few fibres may end in the fascia covering the helix where it turns backwards, but this is rarely a marked attachment.

I have never seen a case in which I could satisfy myself that the muscle was to any great extent *inserted* into the ridge of the helix, as described in nearly all our text-books. In one or two specimens it ended after a short course near the helix, but in front of it, and with scarcely any attachment to it.

It is sometimes stated that the attrahens is occasionally continued in part into this muscle. This is never the case, so far as the true attrahens, as described above, is concerned. But there is frequently continued into it a part of (or, in other words, it is connected above with) the attollens, particularly with the most anterior fibres of the muscle.

Helicis Minor.—I have little or nothing to add to the usual description of this muscle. Its frequent absence, as recorded above, is easily associated with its distinctly rudimentary character in all cases. I would simply call attention to the fact that it usually bridges over a hollow or undulation in the cartilage on which it lies, as in the case of the antitragicus.

Tragicus.—I have always found this muscle present, though occasionally very badly developed. The slip, which is sometimes prolonged from the tragicus to the spine of the helix, was present only twice in twelve ears. I expected to find it much more frequently. In one case almost all the fibres of the muscle arose fan-like from a little tendon, which was attached to a small spine situated at the lower and back part of the tragus.

Antitragicus.—In one case this muscle was not represented by muscular fibres, its place being taken by ill-defined

tendinous fibres. It always, like the helicis minor, will be found bridging over a distinct hollow or undulation in the underlying cartilage of the antitragus. I have never—contrary to the usual description—seen an ear in which the muscle was distinctly attached to the tail of the helix. Its two extremities are connected entirely to the antitragus, never crossing the fissure between this latter and the caudate process of the helix (Fig. 3 M). Owing to the oblique slope of the surface of the antitragus the muscle, when the soft parts of the ear are dissected off from the cartilage, appears to lie perhaps more on the deep than on the superficial surface of the pinna.

Transversus.—This muscle, which is made up of parallel or slightly radiating fibres, forms a thin, broad sheet, which is attached on the one hand to the prominent back of the pinna, opposite what may be described as the junction of the bottom and posterior wall of the concha. It runs obliquely backwards and upwards and gains insertion, not so distinctly into the ridge produced on this surface by the scaphoid fossa as usually described, but rather into the bottom and posterior border of the groove which on this aspect represents the antihelix.

A few times I thought I could trace a connection—not certainly muscular—between the retrahens and this muscle as well as between the retrahens and the obliquus; but I am not quite satisfied on this point.

Obliquus.—Nothing special was noted about this muscle, excepting its constancy. In several books it is described as an occasional muscle. I found it absent only once in twelve ears. Of its connection with the retrahens I have already spoken.

In addition to the above muscles, I have twice found a small muscle made up of short fibres crossing the fissure, which runs nearly horizontally between the lower margin

of the tragus and the lower end of the concha. If this be identified as the *dilator conchæ* of Theile, I think the muscle has been badly named.

In connection with the dissection of the occipito-frontalis, I was struck by the constant presence of a deep fascia of the scalp superficial to the epicranial aponeurosis, although no such structure has to my knowledge been already described. We are all familiar with the peculiar granular appearance of the superficial fascia, which is the only structure of that kind described between the skin and the epicranial aponeurosis. In cleaning the occipito-frontalis I have frequently begun over the occipitalis, and removed the skin and fascia together, cleaning the muscle perfectly at the one operation; this method was continued forwards over the head, the epicranial aponeurosis being left behind perfectly clean. On examining carefully the deep surface of the layer removed, I was surprised to see not the expected granular layer of fat, but, instead, a perfectly well-defined and closely-woven continuous sheet of deep fascia. That this fascia is always present, and that it is a distinct and separate structure, I am thoroughly satisfied. I have not yet had an opportunity of examining into its connections and its nature fully, but I am inclined to think that it is formed by an expansion of the deeper parts of the fibrous trabeculæ of the superficial fascia, with which it is intimately connected. On the other hand, its union with the epicranial aponeurosis is also very close. That such a fascia as this would be present might well be anticipated, for it is extremely unlikely that the fibrous bands which pass through the superficial fascia from the skin would be attached directly to the aponeurosis of a muscle. It is much more probable that these bands would end on a layer of deep fascia, which, in turn, would be connected by ordinary close connective tissue to the underlying aponeurosis.

Consequently I should describe the scalp at the vertex as

being composed of—(1) skin; (2) superficial fascia (a layer of granular-looking fat traversed by numerous fibrous septa); (3) deep fascia (a closely-woven sheet of connective tissue); (4) the epicranial aponeurosis; (5) loose layer of connective tissue; and (6) pericranium.

PECULIAR HORSE-SHOE KIDNEY, AND IRREGULAR LATERAL SINUSES.

By A. BIRMINGHAM, M.D.;

Professor of Anatomy, Catholic University, Ireland.

I wish to place the following on record as irregularities of some interest:—

I. *Peculiar Horse-shoe Kidney.*—In a subject examined during the last winter session my attention was attracted to the unusually low position of the kidneys: the greater part of each seemed to lie in the iliac fossa, while the lower portion even reached into the true pelvis; so much was noted when the abdomen was first opened. At a subsequent stage of the dissection I found that the peculiar position of the kidneys was really due to a displaced horse-shoe kidney which lay much below the usual level. My experience of the horse-shoe variety is that the two kidneys are, as a rule, very little, if at all, displaced in a downward direction; their lower ends are simply joined by a transverse piece which crosses the front of the great vessels.

In the present case each kidney was so much displaced downwards that its middle portion lay upon the common iliac vessels, while its lower part ran down into the true pelvis, and the connecting bridge lay on the front of the sacrum.

There were, in addition, several vascular irregularities, as well as a double left ureter for a few inches from the kidney, conditions not worthy of special note.

II. *Irregular Lateral Sinuses.*—In this case the superior longitudinal sinus divided into nearly two equal parts at a point 1¾ inches above the internal occipital protuberance. The straight sinus divided in a similar fashion about an inch

from the protuberance. The corresponding branches of each trunk ran outwards towards the horizontal division of the crucial ridge, gradually approaching one another, and finally uniting, two inches from the occipital protuberance, to form the lateral sinuses.

REPORT OF COLLECTIVE INVESTIGATION IN THE ANATOMICAL DEPARTMENT OF TRINITY COLLEGE, DUBLIN.

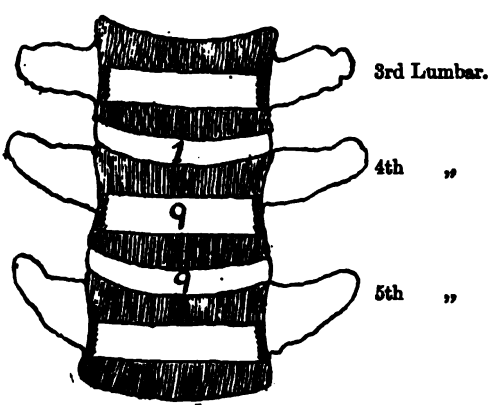
I.—*Report on the Level of Bifurcation of the Abdominal Aorta.* By PEERS PEERS-SMITH, Medical School, T.C.D.

TOTAL number of subjects examined, 47. Males, 22. Females, 25.

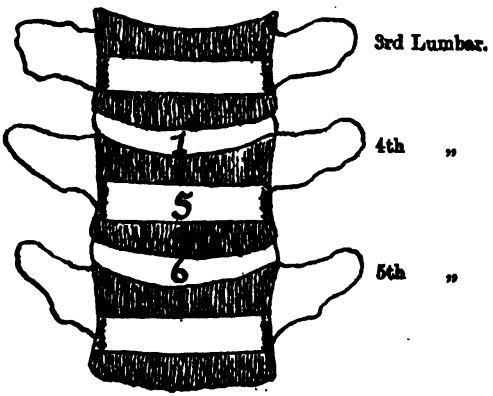
Out of the total number of subjects examined it was found that the most frequent situation for the bifurcation of the abdominal aorta was on the 4th lumbar vertebra, 74·5 per cent. of the total number bifurcating here. The next place of frequency was on the intervertebral disc, between the 4th and 5th lumbar vertebræ, the percentage here being 19·2; while in 4·2 per cent. the aorta bifurcated on the 5th lumbar; and in only 2·1 per cent. on the intervertebral disc, between the 3rd and 4th lumbar vertebræ.

The following diagrams represent the 3rd, 4th, and 5th lumbar vertebræ, each divided into three equal parts, with the corresponding number of bifurcations on them :—

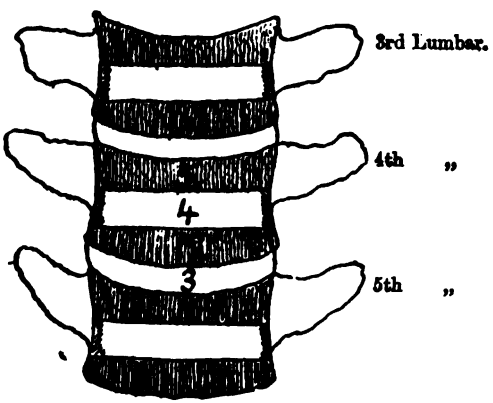
SUBJECTS EXAMINED.



Male.



Female.



Out of all the male subjects examined 63·7 per cent. of the bifurcations was on the 4th lumbar vertebra; 27·3 per cent. on the intervertebral disc, between the 4th and 5th lumbar; 4·5 per cent. on the upper third of the 5th lumbar; and also 4·5 per cent. on the intervertebral disc, between the 3rd and 4th lumbar vertebræ.

Next, taking all the female subjects, it is found that the bifurcation in 84 per cent. of them took place on the 4th

lumbar vertebra; 12 per cent. on the intervertebral disc, between the 4th and 5th lumbar; and only 4 per cent. on the 5th lumbar vertebra.

If, now, the 4th lumbar vertebra be divided into three equal parts—an upper, middle, and lower—and if the percentage of both male and female subjects in which the aorta bifurcated on this vertebra be taken, *it will be seen that the place most commonly chosen for bifurcation is on the lower third*, the percentage being 57·2. The middle third comes next with a percentage of 25·7; and the upper third last, with 17·1 per cent.

If, on the other hand, only the percentage of males be taken, in whom the aorta bifurcated on the 4th lumbar vertebra, it is found that the place most frequently chosen is again on the lower third, the percentage here also being 57·2; the middle third comes next with 35·7 per cent.; and the upper third last, with only 7·1 per cent.

Now, if the same be done with the female subjects, it is again seen that the majority bifurcate on the lower third, the percentage in this sex also being 57·2; while on the upper third the percentage is 23·7, and on the middle third, 19·1.

The following table represents the average height of both male and female subjects at the different points of bifurcation:—

Situation	Average Height for Females	Average Height for Males
Upper Third of the 4th lumbar	5 ft. 4 in.	5 ft. 5 in.
Middle " " "	5 " 5 "	5 " 7 "
Lower " " "	5 " 3 "	5 " 8 "
Intervertebral disc between 4th and 5th lumbar	5 " 4 "	5 " 8 "

It is thus seen that in males the higher the subject the greater the tendency to bifurcation at a lower level. But in females the tendency, if any, is in the opposite direction—that is, the taller the female subject the higher usually is the level of bifurcation. But, of course, as the number of sub-

jects examined was very limited, and as there were great variations in both sexes, no definite rule can be laid down without further investigations being carried out.

The following table also seems to bear out the same statements, namely:—

For MALE subjects whose heights are 5 ft. 9 in. or 5 ft. 8 in.:—

In 66·7 per cent. of these -	The bifurcation was on the lower third of the 4th lumbar vertebra.
In 22·2 per cent. - -	It was on the intervertebral disc between the 4th and 5th lumbar.
In 11·1 per cent. - -	It was on the upper third of the 4th lumbar vertebra.

Again, for heights of 5 ft. 7 in. or 5ft. 6 in.:—

In 50 per cent. of these -	The bifurcation was on the middle third of the 4th lumbar.
In 37·5 per cent. - -	It was on the intervertebral disc between the 4th and 5th lumbar.
In 12·5 per cent. - -	It was on the lower third of the 4th lumbar vertebra.

On the other hand, for FEMALE subjects whose heights were either 5 ft. 6 in. or 5 ft. 5 in.:—

In 50 per cent. of these -	The bifurcation was on the lower third of the 4th lumbar vertebra.
In 25 per cent. - -	It was on the upper third of the 4th lumbar vertebra.
Also in 25 per cent. - -	It was on the intervertebral disc between the 4th and 5th lumbar.

For heights of either 5 ft. 4 in. or 5 ft. 3 in.:—

In 40 per cent. of these -	The bifurcation was on the lower third of the 4th lumbar vertebra.
In 30 per cent. - -	It was on the upper third of the 4th lumbar.
In 20 per cent. - -	It was on the intervertebral disc between the 4th and 5th lumbar.
In 10 per cent. - -	It was on the middle third of the 4th lumbar vertebra.

And, lastly, for those of either 5 ft. 2 in. or 5 ft. 1 in.:—

In 75 per cent. of these -	The bifurcation was on the lower third of the 4th lumbar.
And in 25 per cent. - -	It was on the middle third of the 4th lumbar vertebra.

In many instances in which the aorta bifurcated at a level other than the most usual, no abnormalities in the branches of the artery could be found to account for it.

Also, although in a number of the subjects examined the branches of the aorta were abnormal, in no instance could the level of bifurcation be said to be affected by these peculiarities.

Again, in a few cases curvatures of the spinal column were present, but neither had these any influence on the level of termination of the aorta.

The following are a few of the cases:—

In a female subject of 5 ft. 3 in., in which the right internal iliac came off at the level of the upper third of the 5th lumbar vertebra, the bifurcation was on the upper third of the 4th lumbar. Also, in a male subject of 5 ft. 9 in., in which there was exactly the same high origin of this artery, the bifurcation was on the intervertebral disc, between the 4th and 5th lumbar vertebræ.

Also, in a male subject of 5ft. 9in., in which the aorta bifurcated on the intervertebral disc, between the 3rd and 4th lumbar vertebræ, nothing could be found to account for this high level of bifurcation.

Again, in a male subject of 5ft. 5in., the bifurcation was on the upper third of the 5th lumbar vertebra; in this case also nothing could be found to have any bearing on the low termination of the aorta.

But in a female subject of 5ft. 4in., in whom the same peculiarity existed, a very pronounced lateral curvature of the dorsal region of the spine was present.

A most frequent occurrence, and one which at first sight might appear to have some influence on the level of determination of the aorta, is that, in a good many of the subjects examined, two and sometimes four left renal arteries were found coming separately off the aorta. Yet these in no way had any influence on the place of bifurcation.

Indeed it seems that neither peculiarities with regard to the branches of this artery, nor any curvatures of the vertebral column, have anything to say to the level of bifurcation of the abdominal aorta.

The only thing, in fact, which seems to have some bearing on its situation is the height of the subject.

II.—*Report of Investigations on the Spinal Cord.* By J. Herbert Moorhead, School of Physic, T.C.D.

Level of Termination of Spinal Cord.

The final results of investigation on this subject vary, as evidenced by the examination of statistics, according as both sexes are considered together or as each is taken separately.

If we consider the whole number of subjects examined, regardless of sex, we find that in 65 per cent. of all cases the cord terminates at some point on the 1st lumbar vertebra—not necessarily the lower border—while in 32·5 per cent. the cord reaches the 2nd lumbar vertebra, and in 2·5 per cent. the point of ending is situated on the 12th dorsal vertebra.

In the majority of instances in which the cord ended on the 1st lumbar vertebra the ending was situated on the lower third. This occurred in 65·5 per cent. of all cases terminating on this vertebra, whereas in 30·8 per cent. the point of termination was on the middle third, and in 3·7 per cent. on the upper third.

If the sexes be examined separately, it appears that in males by far the greater number of cords end on the 1st lumbar vertebra rather than on the 2nd lumbar or 12th dorsal vertebra, the percentage of endings on each of the two latter being only 5·8 per cent. as contrasted with 38·2 per cent. on the former. In females, on the contrary, the cord has a distinct tendency to terminate on the 2nd lumbar

vertebra more frequently than on the 1st—52 per cent. of cases ending on the 2nd lumbar vertebra and 48 per cent. on the 1st.

As regards those cases in which the cord ended on the 1st lumbar vertebra, the ending was *most usually on the lower third in both males and females.* In 60 per cent. of male subjects and 72 per cent. of female subjects the termination was on the lower third, while in only 33·3 per cent. of males and 28 per cent. of females was the termination on the middle third and in 6·6 per cent. of males on the upper third.

The great majority of instances in which the cord reached the 2nd lumbar vertebra occurred in *female subjects,* the proportion to males being 12 to 1. In 54 per cent. of these cases (including both sexes) the tip of the conus medullaris reached a point on the upper third of this vertebra situated from ½ cm. to 1 cm. below the upper border, while the remaining cases (all of which were female subjects) were equally divided between the middle and lower thirds. [If females be considered separately, 50 per cent. ended on the upper third and 25 per cent. each on the middle and lower third.]

In only one subject, and that a male, did the cord end on the 12th dorsal vertebra.

Only in 37·5 per cent. of all cases did the cord end at the point usually described as normal—viz., the lower border of the 1st lumbar vertebra; in male subjects the percentage of endings at this point is 47 per cent., and in females 30·4 per cent.

The point of termination of the spinal cord varies in *males* from a point ½ cm. above the lower border of the 12th dorsal vertebra to a point 1 cm. below the upper border of the 2nd lumbar vertebra, and in *females* from a point 1½ cm. below the upper border of the 1st lumbar vertebra to the level of the lower border of the 2nd lumbar vertebra.

The *highest level of termination* of the cord occurred in a *male* subject, and was situated 5 mm. above the lower border of the last dorsal vertebra (in this subject there was marked backward curvature of the spine in the upper dorsal region). The lowest level, occurring in a female subject, was opposite the lower border of the 2nd lumbar vertebra.

Since the most usual situation of the lower end of cords terminating on the 1st lumbar vertebra is in both sexes the lower third, and of those on the 2nd lumbar vertebra is the upper third, it is evident that *a space of about 2½ cms. (whose centre is the middle of the intervertebral disc between the 1st and 2nd lumbar vertebra) would in 60 per cent. of all cases include the termination of the cord.*

Five fœtuses were also examined. In one male fœtus of about six months the cord ended at the lower border of the 2nd lumbar vertebra; in another, at full time, the end of the cord reached as far as the lower border of the 3rd lumbar vertebra. The latter was an anencephalus.

Three female fœtuses were also examined. Of these one, aged six months, was found to have the cord reaching the lower border of the 2nd lumbar vertebra. In the other two, each about five months old, the point of termination was situated at the lower borders of the 3rd and 4th lumbar vertebræ respectively.

Unusually pronounced *lateral* curves of the spinal column may possibly have some effect on the position of the lower end of the cord, since in many cases in which unnatural curves were observed the cord undoubtedly ended at a higher point than usual; but as this also happened in many cases in which no such abnormal curves were present no conclusions of any value can be arrived at on the subject.

In one instance in which there was marked *backward* curvature of the spine in the upper part of the dorsal region, the cord ended at an unusually high level—viz., ½ cm. above

the lower border of the 12th dorsal vertebra. This high ending was not entirely due to an abnormally short cord, the measurement of the cord being 44·7 cms. (*i.e.*, only about 3 mm. shorter than the average). Therefore, in this instance at least, the spinal deformity seems to have had some influence in raising the level of termination of the cord.

The spinal cord has a marked tendency to descend lower in females than in males. This tendency may be partly explained by the fact that relatively to the length of the spinal column the cord is slightly longer in females (as will be shown below): in all probability it is also in part due to sexual peculiarity. Moreover, in females, as contrasted with males, we find much greater inconstancy as regards point of termination, length, and other measurements.

If we take the *average* length of the cord at different points of termination it seems that the average length is greater in cords which descend low down in the spinal canal (this, however, is not always true for individual subjects). Thus, in *males*, the average length of cords which end on and below the lower third of the 1st lumbar vertebra is 45·4 cms., and in cords ending above this point the average length is only 44·5 cms.

In *females* the average length of cords ending on the 2nd lumbar vertebra is 44·8 cms., and on the 1st lumbar vertebra is 42·4 cms.

Length of the Spinal Cord.

As a general rule, as might be expected, the cord is longer *absolutely* in males than in females; yet the longest cord occurred in a female subject, and measured 47 cms., the longest male cord measuring 46·5 cms.

Curiously enough, however, *relatively* to the average length of the spinal column, as measured from the foramen magnum to the base of the sacrum, the *cord is found to be slightly longer in females* than in males.

For, if the average length of the spinal column in males be represented by - - -	100
The proportionate length of the male cord is -	77·1
While, if the spinal column in females be represented by - - - - - -	100
The corresponding length of the female cord is -	79

[Or, to express it differently—

If male column - -	= 100
And male cord - -	= 100
Then female column - -	= 94·8
And female cord - -	= 97·1]

The *limits of variability* in the length of the cord are in males from 43·5 cms. to 46·5 cms., and in females from 39·5 cms. to 47 cms. *The tendency to variation is much greater in females.*

The *average length* of the spinal cord in adult males is 45 cms. [In one male, aged fourteen, the cord measured 34·4 cms.] The average length in adult females is 43·7 cms. The normal length of the cord is usually said to be 18 inches (*i.e.*, 45·6 cms.). This length, however, was only attained in 28 per cent. of male and 10·5 per cent. of female subjects. Therefore the cord is generally somewhat less than 18 inches in length.

The longest cords generally occur in tall subjects. This is, however, by no means constant—*e.g.*, in one male subject, 5 ft. 10 in. in height, the cord measured 43·5 cms., while in another, whose height was only 5 ft. 5 in., the length of the cord was 45 cms.

There seems to be no definite ratio between the length of the cord and the height in any individual subject; but if we take the *average length* of the cord for different heights we generally find that the length varies somewhat in direct proportion to the height—that is, as we descend in the scale of

height the cord becomes gradually shorter. Thus, in males,

for heights of—	The average length of cord =
5 ft. 9 in. and 5 ft. 8 in.	45·7 cms.
5 ft. 7 in. and 5 ft. 6 in.	44·9 cms.

And in females,

for heights of—	The average length of cord =
5 ft. 6 in. and 5 ft. 5 in.	45·6 cms.
5 ft. 4 in. and 5 ft. 3 in.	44·8 cms.

Length of the Spinal Column (measured from the foramen magnum to the base of the sacrum).

The average length of the spinal column in male subjects is 58·3 cms. and in female subjects is 55·3 cms. The ratio of the average length of the column to the average height is practically the *same in males and females.*

For if - - - - - -	100
represent the height in males, then the corresponding length of the male column is - -	34·3
And if the height in females is - - -	100
the length of the female column is - -	34·8

So that the average length of the column bears the same relation to the average height in females as in males.

The average length of the spinal column in each sex seems to vary directly with the height, as may be seen from the following Table, which gives the *average* length of the column for the various heights of the subjects examined:—

MALES.

Height.	Average length of column.
5 ft. 6 in.	56 cms.
5 „ 7 „	58·1 „
5 „ 8 „	60·5 „
5 „ 9 „	60·7 „

FEMALES.

Height.	Average length of column.
5 ft. 2 in.	53·3 cms.
5 „ 3 „	55·2 „
5 „ 4 „	55·8 „
5 „ 5 „	57·5 „

The *average distance from the termination* of the cord to the base of the sacrum is 13·4 cms. in males, and 11·7 cms. in females. The smaller distance in females may be explained not only by the fact that the cord commonly descends lower than in males, but also by the average height being less in the former sex.

[The average height of males examined was 5 ft. 7 in., and of females 5 ft. 3 in.]

In conclusion, from a consideration of the foregoing facts, in so far as they may be relied upon, expressing as they do the results of the investigation of merely a limited number of subjects, it seems evident, since we are compelled to resort to averages in order to show any relation between the point of termination of the cord and its other characteristics, that in any isolated case it would be impossible to say what modifying influence may be exerted on the level of the lower end by the curves of the spinal column, the height of the subject, or the length of the cord itself. The actual point of termination is in all probability influenced by a combination of circumstances of which one of the most important is individual or sexual peculiarity.

III.—*Report on the Presence of the Palmaris Longus, Plantaris, and Pyramidalis Abdominis.* By W. SHACKLETON.

FROM the examination of the palmaris longus in 78 arms the following percentages were obtained:—In 88·45 per cent. the muscle was present; in 11·54 per cent. it was not represented.

Considering right arms only it was present in 92 per cent., absent in 7·9 per cent; whereas in left arms it was found in 85 per cent., wanting in 15 per cent.; from which it would appear to be more frequently absent on the left side. In two arms, one left and one right, the muscle was double; in the case of the left arm, one tendon was inserted into the pisiform bone, the other into the palmar fascia; the corresponding right arm had the muscle normally developed. In the subject which had a double right palmaris longus both tendons obtained insertion into the palmar fascia, and the muscle was absent on the left side.

In one of the left arms examined the tendon of the muscle, which was normal in size, was inserted into the pisiform bone, scarcely obtaining any attachment to the palmar fascia; the corresponding right arm had the muscle very feebly developed.

The plantaris, which was investigated in 73 legs, was present in 93·15 per cent., absent in 6·95 per cent., and did not show preference for either side. In 7 per cent. there was scarcely any muscular belly present; and in one leg the tendon joined the tendo-Achillis 3 inches above its insertion.

The pyramidalis abdominis, examined in 43 subjects, was found to be equally developed on the right and left sides. It was present in 60·47 per cent., absent in 39·53 per cent. Taking into consideration the question of sex, it was found that in males it was present in 63 per cent., absent in 37 per cent.; on the other hand, in females it was only present in 58·4 per cent., and absent in 41·5 per cent.; the whole tending to show that the muscle is becoming extinct, this being more marked in the female sex.

REPORT OF COLLECTIVE INVESTIGATION IN THE ANATOMICAL DEPARTMENT OF THE CATHOLIC UNIVERSITY MEDICAL SCHOOL.

I.—*On the Level of the Termination of the Spinal Cord.* By JOHN A. ROUGHAN, B.A.

I HAVE examined nine subjects with the back slightly and the neck strongly flexed. In four the cord ended at the disc between the 1st and 2nd lumbar vertebræ; in two at the junction of the middle and lower thirds of the 1st lumbar; in two at junction of the middle and lower thirds of the 2nd lumbar; and in one case at the lower end of the second vertebra.

II.—*On the Level of Bifurcation of the Abdominal Aorta* By ROBERT P. FARNAN.

I HAVE examined twenty-two subjects. The aorta divided in fourteen on the body of the 4th lumbar vertebra, slightly to the left of the middle line; of the remaining eight, seven were opposite the disc between the 4th and 5th lumbar, and one opposite that between the 3rd and 4th. In the cases in which division took place on the body of the 4th lumbar, four were above, one at, and five below, the middle.

III.—*On the Presence of the Palmaris Longus, Plantaris, and Pyramidalis.* By P. J. FAGAN, L.R.C.P. & L.R.C.S.

IN 34 arms examined, the palmaris was present in 88·82 per cent.—viz., in 94 per cent. of right, and only in 82·3 per cent. of left arms; it was absent on both sides in one arm. In 34 legs examined, the plantaris was present in 97 per cent.—viz.,

in 100 per cent. of right legs, and in 94·1 per cent. of left limbs. The pyramidalis was examined in 14 subjects. It was present on both sides in 85·7, present on one side in 7·2, and absent on both sides in 7·2 per cent. of cases. It was present on both sides in 9 males; in 5 females it was absent once, and absent on one side once.

INDEX.

[*The names of Contributors are printed in* SMALL CAPITALS.]

Anatomy in general, and the central nervous system in particular, position of, ALEC FRASER on, 343.

Aorta, bifurcation of abdominal, P. PEERS-SMITH on, 390—ROBERT P. FARNAN on, 403.

ATTHILL, LOMBE, on vaginal hysterectomy, 223—ovariotomy performed on an insane patient; the life of a uterine fibroid, 242.

BENNETT, E. H., on fracture of base of skull, 315—fracture of patella, 318

BEWLEY, H. T., on cancrum oris in typhoid fever, 84.

BIRMINGHAM, AMBROSE, muscles of external ear, 369—horse-shoe kidney and peculiar lateral sinuses, 388.

Brain, removal of tumour of, F. ALCOCK NIXON on, 99—to find fissure of Rolando, 103–105.

BURGESS, J. J., on malignant endocarditis, 25—notes on cases of a severe type of influenza, 70.

Cancrum oris in typhoid fever, H. T. BEWLEY on, 84—discussion, 90.

Cells, micro-chemical reaction of, in their relation to immunity, J. ALFRED SCOTT on, 274.

CHANCE, ARTHUR, on operative treatment of enlarged prostate, 119.

Coagulum adherent to mitral valve in acute rheumatism fatal through hyperpyrexia, J. W. MOORE on, 288.

Colectomy for adhesion of cæcum to old ovarian pedicle and tubercular appendix, 216—discussion, 222.

CRAIG, JAMES, on pernicious anæmia, 6—an unusual case of Graves disease, 57.

Endocarditis, malignant, J. J. BURGESS on, 25—varieties of, 25—discussion, 34.

FAGAN, P. J., on palmaris longus, plantaris, and pyramidalis abdominis muscles, 403.

FARNAN, ROBERT P., on bifurcation of abdominal aorta, 403.

FLINN, D. EDGAR, on recent developments in State medicine, 320.

Fœtus, hemi-encephaloid, W. J. THOMPSON on, 253.

FRANKS, KENDAL, on fibrous stricture of the œsophagus treated by gastrotomy and retrograde dilatation, 142—cases of, collected, 150–153—Hagenbach's method, 154.

FRASER, ALEC, on the position of anatomy in general and the central nervous system in particular, 343—lobus olfactorius impar, 359—various monstrosities, 364—transposition of viscera, 367.

Fraser's method of finding fissure of Rolando, 104.

Graves' disease, JAMES CRAIG on, 57—functions of thyroid gland, 62—clinical features of myxœdema and of Grave's disease, 64—occurrence in animals, 67—discussion, 68.

Gunshot wounds, AUSTIN MELDON on, 161—discussion, 162.

Herniæ as the result of congenital defect of linea alba, or as the outcome of laparotomy, J. S. M'ARDLE on, 203—discussion, 212.

Hospital relief, some points in connection with administration of, H. C. TWEEDY on, 332—discussion, 341.

Hydrocephalus (two cases of), associated with complete absence of communication between the fourth ventricle and the sub-arachnoid space, JOSEPH O'CARROLL on, 293.

Influenza, notes on cases of a severe type of, J. J. BURGESS on, 70—treatment, 79—immunity, 80—discussion, 80.

Kidney, single unilateral, H. C. TWEEDY on, 356—discussion, 358; horseshoe, and peculiar lateral sinuses, DR. A. BIRMINGHAM on, 388.

Laminectomy in spinal injury, T. MYLES on, 130—discussion, 139.

LENTAIGNE, J. V., on popliteal aneurism, 187.

LITTLE, JAS., on sequel of a case of myxœdema treated by thyroid juice, 48.

Lobus olfactorius impar, ALEC FRASER on, 359—discussion, 362.

Locomotor ataxy with specimen of Charcot's disease, G. P. L. NUGENT on, 305—discussion, 313.

MADDEN, T. MORE, on puerperal septicæmia, 256.

M'ARDLE, J. S., on nephrorrhaphy and nephrectomy, 165—on operative treatment of such herniæ as appear the result of congenital defect of linea alba, or as the outcome of laparotomy, 203.

MELDON, AUSTIN, on cases of gunshot wounds, 161.

Monstrosities, ALEC FRASER on, 364.

MOORE, J. W., on associated paralysis of right portio dura and pneumogastric nerves, 35—coagulum adherent to mitral valve in a case of acute rheumatism fatal through hyperpyrexia, 288.

MOORHEAD, J. HERBERT, level of termination of spinal cord, 395.

Muscles of external ear, AMBROSE BIRMINGHAM on, 369—palmaris longus, plantaris, and pyramidalis abdominis, W. SHACKLETON, 401—P. J. FAGAN, 403.

MYLES, T., on urinary fistulæ and their treatment, 108—on laminectomy in spinal injury, 130.

Myomata treated by ergot, R. D. PUREFOY on, 236—discussion, 240.

Myxœdema treated by thyroid juice, sequel to a case of, JAS. LITTLE on, 48—discussion, 51.

Naso-pharyngeal fibroma, R. H. WOODS on, 194—discussion, 201.

Nephrorrhaphy and nephrectomy, J. S. M'ARDLE on, 165—line of incision, 169—ligatures, 170—treatment of ureter, 173—discussion, 178.

NIXON, F. ALCOCK, on removal of tumour of brain, 99.

NUGENT, G. P. L., locomotor ataxy with specimen of Charcot's disease, 305.

O'CARROLL, JOSEPH, on two cases of hydrocephalus associated with complete absence of communication between the fourth ventricle and the sub-arachnoid space, 293.

Œsophagus, fibrous stricture of, treated by gastrotomy and retrograde dilatation, KENDAL FRANKS on, 142—collected cases, 150-153—discussion, 157.

Ovariotomy performed on insane patient, LOMBE ATTHILL on, 242—discussion, 244.

Paralysis of right portio dura and pneumogastric nerves, J. W. MOORE on, 35—discussion, 47.

PARSONS, ALFRED R., on tetany, 93.

Patella, fracture of, E. H. BENNETT on, 318—discussion, 319.

PEERS-SMITH, PEERS, Bifurcation of abdominal aorta, 390.

Pernicious anæmia, J. CRAIG on, 6—symptoms, 12—pyrexia, 12—blood in, 13—urine, 15—treatment, 22—discussion, 24.

Popliteal aneurism, J. V. LENTAIGNE on, 187—discussion on, 192.

PRATT, J. DALLAS, on suture of sciatic nerve, 181.

Prostate, operative treatment of, A. CHANCE on, 119—discussion, 126.

Puerperal septicæmia, T. MORE MADDEN on, 256—ætiology, 257—traumatic causes, 259—atmospheric, epidemic, and endemic, 264—lying-in hospitals, 266—prophylaxis, 266—treatment, 268—discussion, 272.

PUREFOY, R. D., on myomata treated by ergot, 236.

Reid's method of finding fissure of Rolando, 104.

Rolando, fissure of, Thane's method of finding, 103—Reid's, 104—Fraser's, 104.

ROUGHAN, JOHN A., level of termination of spinal cord, 403.

Sarcomata in children, 175.

Sciatic nerve, suture of, J. Dallas Pratt on, 181—discussion, 185.

Sclerosis (insular). H. C. Tweedy on, 52—discussion, 55.

Scott, J. Alfred, on micro-chemical reaction of cells in their relation to immunity, 274.

Shackleton, W., palmaris longus, plantaris, and pyramidalis abdominis, 401.

Skull, fracture of base of, E. H. Bennett on, 315.

Smith, Alfred J., colectomy for adhesion of cæcum to old ovarian pedicle and tubercular appendix, 216—ruptured tubal pregnancy successfully treated by abdominal section, 246.

Smith, W. G., on thrombosis of the portal, mesenteric, and gastric veins, 82.

Spinal cord, level of termination, J. Herbert Moorhead, 395—J. A. Roughan, 403.

State medicine, recent developments in, D. Edgar Flinn on, 320.

Stomach, dilatation of, with remarks on enteroptosis (Glénard's disease), H. C. Tweedy on, 298—discussion, 303.

Tetany, Alfred R. Parsons on, 93—discussion, 106.

Thane's method of finding fissure of Rolando, 108.

Thompson, W. J., on hemi-encephaloid fœtus, 253.

Thrombosis of portal, mesenteric, and gastric veins, W. G. Smith on, 82—discussion, 88.

Tubal pregnancy (ruptured) with intra-peritoneal hæmorrhage, successfully treated by abdominal section, A. J. Smith on, 246—discussion, 251.

Tweedy, H. C., on warty disease of the legs, 1—Note on a case of insular sclerosis, 52—dilatation of the stomach, with remarks on enteroptosis (Glénard's disease), 298—some points in connection with the administration of hospital relief, 332—single unilateral kidney, 356.

Urinary fistulæ and their treatment, T. Myles on, 108—discussion, 116.

Vaginal hysterectomy, Lombe Atthill on, 223—discussion, 233.

Viscera, transposition of, Alec Fraser on, 367.

Warty disease of the legs, H. C. Tweedy on, 1—discussion, 5.

Woods, Robert H., on naso-pharyngeal fibroma, 194.

Printed by John Falconer, 53 Upper Sackville-street, Dublin.

1054

NB 361